Bilag A Analyserapport

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Rapportnr.: AR-24-VL-01013736-01
Batchnr.: EUAA59-24013736
Kundenr.: VL0000309
Rapportdato: 12.04.2024

Analyserapport

Sagsnavn: Udvaskning af PFAS
Prøvetype: Jord
Prøveudtagning: 12.03.2024 - 13.03.2024
Prøvetager: Rekvirenten mblr
Modt. dato: 14.03.2024
Analyseperiode: 15.03.2024 - 12.04.2024

Lab prøvenr:	862-2024-01373601	862-2024-01373602	862-2024-01373603	862-2024-01373604	862-2024-01373605	Enhed	DL.	Urel(%)	¤)
Prøvemærke:	KA1-1	KA1-1	KA1-1	KA2-1	KA2-1				
Prøvedybde m u.t.:	0,4	1	1,6	0,4	1				
PFBS (Perfluorbutansulfonsyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFHxA (Perfluorhexansyre) *M0446 LC-MS/MS*	0,00092	0,0048	0,0023	0,0049	0,0086	mg/kg ts.	3e-005	50	A
PFHpA (Perfluorheptansyre) *M0446 LC-MS/MS*	0,00055	0,0013	0,00030	0,00088	0,0016	mg/kg ts.	3e-005	50	A
PFDA (Perfluordekansyre) *M0446 LC-MS/MS*	0,00038	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFUnDA (Perfluorundekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFDoDA (Perfluordodekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
6:2 FTS (Fluortelomersulfonat) *M0446 LC-MS/MS*	0,089	0,0059	0,052	0,13	0,13	mg/kg ts.	6e-005	50	A
PFBA (Perfluorbutansyre) *M0446 LC-MS/MS*	0,00027	0,0015	0,00048	0,00069	0,0015	mg/kg ts.	0,0001	50	A
PFPeA (Perfluorpentansyre) *M0446 LC-MS/MS*	0,0015	0,012	0,0036	0,0058	0,012	mg/kg ts.	3e-005	50	A
PFHpS (Perfluorheptansulfonsyre) *M0446 LC-MS/MS*	0,00012	< 0,00003	0,000031	0,00020	0,000057	mg/kg ts.	3e-005	50	A
PFTrDA (Perfluortridekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFDS (Perfluordekansulfonsyre) *M0446 LC-MS/MS*	< 0,00003	0,000048	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFPeS (Perfluorpentansulfonsyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFOS (Perfluoroktansulfonsyre) Lineær *M0446 LC-MS/MS*	0,28	0,0097	0,0035	0,014	0,0042	mg/kg ts.	6e-005	50	A
PFHxS (Perfluorhexansulfonsyre) Lineæ *M0446 LC-MS/MS*	0,00051	0,00072	0,00015	0,00049	0,00039	mg/kg ts.	3e-005	50	A
PFOSA (Perfluoroktansulfonamid) Linea *M0446 LC-MS/MS*	0,00014	0,00018	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFNS (Perfluornonansulfonsyre) *M0446 LC-MS/MS*	< 0,0002	< 0,0002	< 0,0002	< 0,0002	< 0,0002	mg/kg ts.	0,0002	50	A
PFDoDS (Perfluordodekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFUnDS (Perfluorundekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFTrDS (Perfluortridekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFNA (Perfluornonansyre) Lineær *M0446 LC-MS/MS*	0,0011	< 0,00003	< 0,00003	0,00017	0,000083	mg/kg ts.	3e-005	50	A
Sum af 22 PFAS jord (lineær) *Beregning*	0,37507	0,036238	0,062481	0,15752	0,15862	mg/kg ts.			*A
Sum af 4 PFAS (lineær) *Beregning*	0,28219	0,01051	0,00377	0,01505	0,004863	mg/kg ts.			*A
Sum 22 PFAS jord (lineær+forgrenet) *Beregning*	0,36627	0,033838	0,013211	0,03856	0,03187	mg/kg ts.			*A
Sum 4 PFAS jord (lineær+forgrenet) *Beregning*	0,36229	0,01387	0,0065	0,02609	0,008113	mg/kg ts.			*A
PFOA (Perfluoroktansyre) Lineær *M0446 LC-MS/MS*	0,00058	0,000090	0,00012	0,00039	0,00019	mg/kg ts.	3e-005		A
PFHxS, Lineær+forgrenet *M0446 LC-MS/MS*	0,00061	0,00078	0,00018	0,00050	0,00044	mg/kg ts.	3e-005	50	A
PFNA (Perfluornonansyre) Lineær+forgr *M0446 LC-MS/MS*	0,0011	< 0,00003	< 0,00003	0,00017	0,000083	mg/kg ts.	3e-005	50	A

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Kundenr.: VL0000309
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Sagsnavn: Udvaskning af PFAS
Prøvetype: Jord
Prøveudtagning: 12.03.2024 - 13.03.2024
Prøvetager: Rekvirenten mblr
Modt. dato: 14.03.2024
Analyseperiode: 15.03.2024 - 12.04.2024

Lab prøvenr:	862-2024-01373601	862-2024-01373602	862-2024-01373603	862-2024-01373604	862-2024-01373605	Enhed	DL.	Urel(%)	¤)
Prøvemærke:	KA1-1	KA1-1	KA1-1	KA2-1	KA2-1				
Prøvedybde m u.t.:	0,4	1	1,6	0,4	1				
PFOA (Perfluoroktansyre) Lineær+forgre *M0446 LC-MS/MS*	0,00058	0,000090	0,00012	0,00042	0,00019	mg/kg ts.	3e-005	50	A
PFOS (Perfluoroktansulfonsyre) Lineær· *M0446 LC-MS/MS*	0,36	0,013	0,0062	0,025	0,0074	mg/kg ts.	6e-005	50	A
PFOSA (Perfluoroktansulfonamid) Linea *M0446 LC-MS/MS*	0,00012	0,00016	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
Tørstof *Gravimetrisk*	81	84	89	85	79	%	1	15	A
Organiske samleparametre									
TOC, totalt org. kulstof *DIN ISO 10694: 1995-03 Forbrænding*	1,5	0,5	0,2	0,3	0,3	% (w/w) ts.	0,1	6,31	B

Underleverandør:
A: Underleverandør (DS EN ISO/IEC 17025 DANAK 168)
B: Underleverandør (DIN EN ISO/IEC 17025:2018 DAkkS D-PL-20226-01-00)

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Prøvetype: Jord
Prøveudtagning: 12.03.2024 - 13.03.2024
Prøvetager: Rekvirenten mblr
Modt. dato: 14.03.2024
Analyseperiode: 15.03.2024 - 12.04.2024

Lab prøvenr:	862-2024-01373606	862-2024-01373607	862-2024-01373608	862-2024-01373609	862-2024-01373610	Enhed	DL.	Urel(%)	¤)
Prøvemærke:	KA2-1	KB1-1	KB1-1	KB1-1	KB2-1				
Prøvedybde m u.t.:	1,4	0,6	2	3	2				
PFBS (Perfluorbutansulfonsyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFHxA (Perfluorhexansyre) *M0446 LC-MS/MS*	0,0021	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFHpA (Perfluorheptansyre) *M0446 LC-MS/MS*	0,00031	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFDA (Perfluordekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFUnDA (Perfluorundekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFDoDA (Perfluordodekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
6:2 FTS (Fluortelomersulfonat) *M0446 LC-MS/MS*	0,029	< 0,00006	< 0,00006	< 0,00006	< 0,00006	mg/kg ts.	6e-005	50	A
PFBA (Perfluorbutansyre) *M0446 LC-MS/MS*	0,00039	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFPeA (Perfluorpentansyre) *M0446 LC-MS/MS*	0,0032	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFHpS (Perfluorheptansulfonsyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFTrDA (Perfluortridekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFDS (Perfluordekansulfonsyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFPeS (Perfluorpentansulfonsyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFOS (Perfluoroktansulfonsyre) Lineær *M0446 LC-MS/MS*	0,0025	< 0,00006	< 0,00006	< 0,00006	0,00052	mg/kg ts.	6e-005	50	A
PFHxS (Perfluorhexansulfonsyre) Lineæ *M0446 LC-MS/MS*	0,00017	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFOSA (Perfluoroktansulfonamid) Linea *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFNS (Perfluornonansulfonsyre) *M0446 LC-MS/MS*	< 0,0002	< 0,0002	< 0,0002	< 0,0002	< 0,0002	mg/kg ts.	0,0002	50	A
PFDoDS (Perfluordodekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFUnDS (Perfluorundekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFTrDS (Perfluortridekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFNA (Perfluornonansyre) Lineær *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
Sum af 22 PFAS jord (lineær) *Beregning*	0,037726	#	#	#	0,00052	mg/kg ts.			*A
Sum af 4 PFAS (lineær) *Beregning*	0,002726	#	#	#	0,00052	mg/kg ts.			*A
Sum 22 PFAS jord (lineær+forgrenet) *Beregning*	0,009736	#	#	#	0,00085	mg/kg ts.			*A
Sum 4 PFAS jord (lineær+forgrenet) *Beregning*	0,003736	#	#	#	0,00085	mg/kg ts.			*A
PFOA (Perfluoroktansyre) Lineær *M0446 LC-MS/MS*	0,000056	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005		A
PFHxS, Lineær+forgrenet *M0446 LC-MS/MS*	0,00018	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFNA (Perfluornonansyre) Lineær+forgr *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A

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Sagsnavn: Udvaskning af PFAS
Prøvetype: Jord
Prøveudtagning: 12.03.2024 - 13.03.2024
Prøvetager: Rekvirenten mblr
Modt. dato: 14.03.2024
Analyseperiode: 15.03.2024 - 12.04.2024

Lab prøvenr:	862-2024-01373606	862-2024-01373607	862-2024-01373608	862-2024-01373609	862-2024-01373610	Enhed	DL.	Urel(%)	¤)
Prøvemærke:	KA2-1	KB1-1	KB1-1	KB1-1	KB2-1				
Prøvedybde m u.t.:	1,4	0,6	2	3	2				
PFOA (Perfluoroktansyre) Lineær+forgre *M0446 LC-MS/MS*	0,000056	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFOS (Perfluoroktansulfonsyre) Lineær· *M0446 LC-MS/MS*	0,0035	< 0,00006	< 0,00006	< 0,00006	0,00085	mg/kg ts.	6e-005	50	A
PFOSA (Perfluoroktansulfonamid) Linea *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
Tørstof *Gravimetrisk*	88	87	81	88	89	%	1	15	A
Organiske samleparametre									
TOC, totalt org. kulstof *DIN ISO 10694: 1995-03 Forbrænding*	0,4	0,3	< 0,1	0,8	0,5	% (w/w) ts.	0,1	6,31	B

Underleverandør:
A: Underleverandør (DS EN ISO/IEC 17025 DANAK 168)
B: Underleverandør (DIN EN ISO/IEC 17025:2018 DAkkS D-PL-20226-01-00)

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Prøvetype: Jord
Prøveudtagning: 12.03.2024 - 13.03.2024
Prøvetager: Rekvirenten mblr
Modt. dato: 14.03.2024
Analyseperiode: 15.03.2024 - 12.04.2024

Lab prøvenr:	862-2024-01373611	862-2024-01373612	862-2024-01373613	862-2024-01373614	862-2024-01373615	Enhed	DL.	Urel(%)	¤)
Prøvemærke:	KB2-1	KB2-1	KC1-1	KC1-1	KC1-1				
Prøvedybde m u.t.:	2,6	3	0,2	0,8	1,6				
PFBS (Perfluorbutansulfonsyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFHxA (Perfluorhexansyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	0,000032	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFHpA (Perfluorheptansyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFDA (Perfluordekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFUnDA (Perfluorundekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFDoDA (Perfluordodekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
6:2 FTS (Fluortelomersulfonat) *M0446 LC-MS/MS*	< 0,00006	< 0,00006	< 0,00006	< 0,00006	< 0,00006	mg/kg ts.	6e-005	50	A
PFBA (Perfluorbutansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFPeA (Perfluorpentansyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFHpS (Perfluorheptansulfonsyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFTrDA (Perfluortridekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFDS (Perfluordekansulfonsyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFPeS (Perfluorpentansulfonsyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFOS (Perfluoroktansulfonsyre) Lineær *M0446 LC-MS/MS*	0,00011	0,0042	0,0011	0,0012	0,0033	mg/kg ts.	6e-005	50	A
PFHxS (Perfluorhexansulfonsyre) Lineæ *M0446 LC-MS/MS*	< 0,00003	< 0,00003	0,00018	0,00014	0,00013	mg/kg ts.	3e-005	50	A
PFOSA (Perfluoroktansulfonamid) Linea *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFNS (Perfluornonansulfonsyre) *M0446 LC-MS/MS*	< 0,0002	< 0,0002	< 0,0002	< 0,0002	< 0,0002	mg/kg ts.	0,0002	50	A
PFDoDS (Perfluordodekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFUnDS (Perfluorundekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFTrDS (Perfluortridekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFNA (Perfluornonansyre) Lineær *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
Sum af 22 PFAS jord (lineær) *Beregning*	0,00011	0,0042	0,001312	0,00134	0,00343	mg/kg ts.			*A
Sum af 4 PFAS (lineær) *Beregning*	0,00011	0,0042	0,00128	0,00134	0,00343	mg/kg ts.			*A
Sum 22 PFAS jord (lineær+forgrenet) *Beregning*	0,00011	0,0062	0,002076	0,00164	0,003474	mg/kg ts.			*A
Sum 4 PFAS jord (lineær+forgrenet) *Beregning*	0,00011	0,0062	0,002044	0,00164	0,003474	mg/kg ts.			*A
PFOA (Perfluoroktansyre) Lineær *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005		A
PFHxS, Lineær+forgrenet *M0446 LC-MS/MS*	< 0,00003	< 0,00003	0,00021	0,00014	0,00014	mg/kg ts.	3e-005	50	A
PFNA (Perfluornonansyre) Lineær+forgr *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A

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Rapportnr.: AR-24-VL-01013736-01
Batchnr.: EUAA59-24013736
Kundenr.: VL0000309
Rapportdato: 12.04.2024

Analyserapport

Sagsnavn: Udvaskning af PFAS
Prøvetype: Jord
Prøveudtagning: 12.03.2024 - 13.03.2024
Prøvetager: Rekvirenten mblr
Modt. dato: 14.03.2024
Analyseperiode: 15.03.2024 - 12.04.2024

Lab prøvenr:	862-2024-01373611	862-2024-01373612	862-2024-01373613	862-2024-01373614	862-2024-01373615	Enhed	DL.	Urel(%)	¤)
Prøvemærke:	KB2-1	KB2-1	KC1-1	KC1-1	KC1-1				
Prøvedybde m u.t.:	2,6	3	0,2	0,8	1,6				
PFOA (Perfluoroktansyre) Lineær+forgre *M0446 LC-MS/MS*	< 0,00003	< 0,00003	0,000034	< 0,00003	0,000034	mg/kg ts.	3e-005	50	A
PFOS (Perfluoroktansulfonsyre) Lineær· *M0446 LC-MS/MS*	0,00011	0,0062	0,0018	0,0015	0,0033	mg/kg ts.	6e-005	50	A
PFOSA (Perfluoroktansulfonamid) Linea *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
Tørstof *Gravimetrisk*	88	82	98	86	95	%	1	15	A
Organiske samleparametre									
TOC, totalt org. kulstof *DIN ISO 10694: 1995-03 Forbrænding*	0,1	0,5	0,6	< 0,1	< 0,1	% (w/w) ts.	0,1	6,31	B

Underleverandør:
A: Underleverandør (DS EN ISO/IEC 17025 DANAK 168)
B: Underleverandør (DIN EN ISO/IEC 17025:2018 DAkkS D-PL-20226-01-00)

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Batchnr.: EUAA59-24013736
Kundenr.: VL0000309
Rapportdato: 12.04.2024

Analyserapport

Sagsnavn: Udvaskning af PFAS
Prøvetype: Jord
Prøveudtagning: 12.03.2024 - 13.03.2024
Prøvetager: Rekvirenten mblr
Modt. dato: 14.03.2024
Analyseperiode: 15.03.2024 - 12.04.2024

Lab prøvenr:	862-2024-01373616	862-2024-01373617	862-2024-01373618	Enhed	DL.	Urel(%)	¤)
Prøvemærke:	KC2-1	KC2-1	KC2-1				
Prøvedybde m u.t.:	0,4	0,8	1,8				
PFBS (Perfluorbutansulfonsyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFHxA (Perfluorhexansyre) *M0446 LC-MS/MS*	0,000053	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFHpA (Perfluorheptansyre) *M0446 LC-MS/MS*	0,000060	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFDA (Perfluordekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFUnDA (Perfluorundekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFDoDA (Perfluordodekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
6:2 FTS (Fluortelomersulfonat) *M0446 LC-MS/MS*	< 0,00006	< 0,00006	< 0,00006	mg/kg ts.	6e-005	50	A
PFBA (Perfluorbutansyre) *M0446 LC-MS/MS*	0,00010	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFPeA (Perfluorpentansyre) *M0446 LC-MS/MS*	0,00016	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFHpS (Perfluorheptansulfonsyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	0,000061	mg/kg ts.	3e-005	50	A
PFTrDA (Perfluortridekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFDS (Perfluordekansulfonsyre) *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFPeS (Perfluorpentansulfonsyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFOS (Perfluoroktansulfonsyre) Lineær *M0446 LC-MS/MS*	0,0054	0,0017	< 0,00006	mg/kg ts.	6e-005	50	A
PFHxS (Perfluorhexansulfonsyre) Lineæ *M0446 LC-MS/MS*	0,00012	< 0,00003	0,00011	mg/kg ts.	3e-005	50	A
PFOSA (Perfluoroktansulfonamid) Linea *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFNS (Perfluornonansulfonsyre) *M0446 LC-MS/MS*	< 0,0002	< 0,0002	< 0,0002	mg/kg ts.	0,0002	50	A
PFDoDS (Perfluordodekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFUnDS (Perfluorundekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFTrDS (Perfluortridekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFNA (Perfluornonansyre) Lineær *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
Sum af 22 PFAS jord (lineær) *Beregning*	0,006003	0,0017	0,000171	mg/kg ts.			*A
Sum af 4 PFAS (lineær) *Beregning*	0,00563	0,0017	0,00011	mg/kg ts.			*A
Sum 22 PFAS jord (lineær+forgrenet) *Beregning*	0,006103	0,0017	0,000701	mg/kg ts.			*A
Sum 4 PFAS jord (lineær+forgrenet) *Beregning*	0,00573	0,0017	0,00064	mg/kg ts.			*A
PFOA (Perfluoroktansyre) Lineær *M0446 LC-MS/MS*	0,00011	< 0,00003	< 0,00003	mg/kg ts.	3e-005		A
PFHxS, Lineær+forgrenet *M0446 LC-MS/MS*	0,00012	< 0,00003	0,00011	mg/kg ts.	3e-005	50	A
PFNA (Perfluornonansyre) Lineær+forgr *M0446 LC-MS/MS*	< 0,00003	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A

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Rapportnr.: AR-24-VL-01013736-01
Batchnr.: EUAA59-24013736
Kundenr.: VL0000309
Rapportdato: 12.04.2024

Analyserapport

Sagsnavn:	Udvaskning af PFAS
Prøvetype:	Jord
Prøveudtagning:	12.03.2024 - 13.03.2024
Prøvetager:	Rekvirenten mblr
Modt. dato:	14.03.2024
Analyseperiode:	15.03.2024 - 12.04.2024

Lab prøvenr:	**862-2024-01373616**	**862-2024-01373617**	**862-2024-01373618**	**Enhed**	**DL.**	**Urel(%)**	¤)
Prøvemærke:	KC2-1	KC2-1	KC2-1				
Prøvedybde m u.t.:	0,4	0,8	1,8				
PFOA (Perfluoroktansyre) Lineær+forgre *M0446 LC-MS/MS*	0,00011	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFOS (Perfluoroktansulfonsyre) Lineær· *M0446 LC-MS/MS*	0,0055	0,0017	0,00053	mg/kg ts.	6e-005	50	A
PFOSA (Perfluoroktansulfonamid) Linea *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
Tørstof *Gravimetrisk*	87	85	91	%	1	15	A
Organiske samleparametre							
TOC, totalt org. kulstof *DIN ISO 10694: 1995-03 Forbrænding*	0,8	0,5	< 0,1	% (w/w) ts.	0,1	6,31	B

Underleverandør:
A: Underleverandør (DS EN ISO/IEC 17025 DANAK 168)
B: Underleverandør (DIN EN ISO/IEC 17025:2018 DAkkS D-PL-20226-01-00)

Batchkommentar:

Excel-ark med prøvningsresultaterne medsendes som bilag.

Kopi til:

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12.04.2024

Sabina Michela Nørgaard Baumann
Team Lead / Chemist Eurofins Miljø A/S

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<:	mindre end	*):	Ikke omfattet af akkrediteringen
>:	større end	i.p.:	ikke påvist
#:	ingen parametre er påvist	i.m.:	ikke målelig
DL:	Detektionsgrænse	¤):	udført af underleverandør

Urel (%): Ekspanderede relative måleusikkerhed med dækningsfaktor 2. For resultater på detektionsgrænseniveau kan usikkerheden være større end oplyst på rapporten.

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Rapportnr.: AR-24-VL-01025207-01
Batchnr.: EUAA59-24025207
Kundenr.: VL0002604
Rapportdato: 17.05.2024

Analyserapport

Sagsnr.: -
Sagsnavn: AAU Udvaskning af PFAS
Prøvetype: Jord
Prøveudtagning: 12.03.2024 - 13.03.2024
Prøvetager: Rekvirenten mblr
Modt. dato: 10.05.2024
Analyseperiode: 10.05.2024 - 17.05.2024

Lab prøvenr:	862-2024-02520701	862-2024-02520702	862-2024-02520703	Enhed	DL.	Urel(%)	[B]
Prøvemærke:	KA1-1	KA2-1	KC2-1				
Prøvedybde m u.t.:	0,8	0,8	1,6				
PFBS (Perfluorbutansulfonsyre) *M0446 LC-MS/MS*	0,000030	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFHxA (Perfluorhexansyre) *M0446 LC-MS/MS*	0,0037	0,0026	< 0,00003	mg/kg ts.	3e-005	50	A
PFHpA (Perfluorheptansyre) *M0446 LC-MS/MS*	0,0035	0,00054	< 0,00003	mg/kg ts.	3e-005	50	A
PFDA (Perfluordekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFUnDA (Perfluorundekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFDoDA (Perfluordodekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
6:2 FTS (Fluortelomersulfonat) *M0446 LC-MS/MS*	0,00099	0,041	< 0,00006	mg/kg ts.	6e-005	50	A
PFBA (Perfluorbutansyre) *M0446 LC-MS/MS*	0,0011	0,00053	< 0,0001	mg/kg ts.	0,0001	50	A
PFPeA (Perfluorpentansyre) *M0446 LC-MS/MS*	0,0097	0,0043	< 0,00003	mg/kg ts.	3e-005	50	A
PFHpS (Perfluorheptansulfonsyre) *M0446 LC-MS/MS*	0,000080	< 0,00003	0,000032	mg/kg ts.	3e-005	50	A
PFTrDA (Perfluortridekansyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFDS (Perfluordekansulfonsyre) *M0446 LC-MS/MS*	0,000096	< 0,00003	< 0,00003	mg/kg ts.	3e-005	50	A
PFPeS (Perfluorpentansulfonsyre) *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
PFNS (Perfluornonansulfonsyre) *M0446 LC-MS/MS*	< 0,0002	< 0,0002	< 0,0002	mg/kg ts.	0,0002	50	A
PFDoDS (Perfluordodekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFUnDS (Perfluorundekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
PFTrDS (Perfluortridekansulfonsyre) *M0446 LC-MS/MS*	< 0,001	< 0,001	< 0,001	mg/kg ts.	0,001	50	A
Sum 22 PFAS jord (lineær+forgrenet) *Beregning*	0,036	0,011	0,0050	mg/kg ts.			*A
Sum 4 PFAS jord (lineær+forgrenet) *Beregning*	0,018	0,0034	0,0050	mg/kg ts.			*A
PFHxS, Lineær+forgrenet *M0446 LC-MS/MS*	0,0013	0,00014	0,00010	mg/kg ts.	3e-005	50	A
PFNA (Perfluornonansyre) Lineær+forgr *M0446 LC-MS/MS*	0,000082	0,000048	< 0,00003	mg/kg ts.	3e-005	50	A
PFOA (Perfluoroktansyre) Lineær+forgre *M0446 LC-MS/MS*	0,00016	0,000099	< 0,00003	mg/kg ts.	3e-005	50	A
PFOS (Perfluoroktansulfonsyre) Lineær- *M0446 LC-MS/MS*	0,016	0,0031	0,0049	mg/kg ts.	6e-005	50	A
PFOSA (Perfluoroktansulfonamid) Linea *M0446 LC-MS/MS*	< 0,0001	< 0,0001	< 0,0001	mg/kg ts.	0,0001	50	A
Tørstof *Gravimetrisk*	81	82	93	%	1	15	A

Underleverandør:
A: Underleverandør (DS EN ISO/IEC 17025 DANAK 168)

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Rapportnr.:	AR-24-VL-01025207-01
Batchnr.:	EUAA59-24025207
Kundenr.:	VL0002604
Rapportdato:	17.05.2024

Analyserapport

Sagsnr.:	-
Sagsnavn:	AAU Udvaskning af PFAS
Prøvetype:	Jord
Prøveudtagning:	12.03.2024 - 13.03.2024
Prøvetager:	Rekvirenten mblr
Modt. dato:	10.05.2024
Analyseperiode:	10.05.2024 - 17.05.2024

Lab prøvenr:	**862-2024-02520701**	**862-2024-02520702**	**862-2024-02520703**	**Enhed**	**DL.**	**Urel(%)**	**¤)**
Prøvemærke:	KA1-1	KA2-1	KC2-1				
Prøvedybde m u.t.:	0,8	0,8	1,6				

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17.05.2024

Christina B. Christensen
Christina Bonde Christensen
Kemiker Eurofins VBM Laboratoriet A/S

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>:	større end	i.p.:	ikke påvist
#:	ingen parametre er påvist	i.m.:	ikke målelig
DL:	Detektionsgrænse	¤):	udført af underleverandør

Urel (%): Ekspanderede relative måleusikkerhed med dækningsfaktor 2. For resultater på detektionsgrænseniveau kan usikkerheden være større end oplyst på rapporten.

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Rapportnr.:	AR-24-VL-01038135-01
Batchnr.:	EUAA59-24038135
Kundenr.:	VL0002604
Rapportdato:	18.07.2024

Analyserapport

Sagsnr.:	Udvaskning af PFAS	
Sagsnavn:	AAU undvasknings projekt	
Prøvetype:	Jord	
Prøveudtagning:	12.03.2024	
Prøvetager:	Rekvirenten	mblr
Modt. dato:	08.07.2024	
Analyseperiode:	08.07.2024 - 18.07.2024	

Lab prøvenr:	**862-2024-03813501**	**862-2024-03813502**	**862-2024-03813503**	**862-2024-03813504**	**862-2024-03813505**	**Enhed**	**DL.**	**Urel(%)**	**¤)**
Prøvemærke:	KA1-2	KA2-2	KB1-2	KB2-2	KC1-2				
Prøvedybde m u.t.:	0,8	1,8	2,2	2,8	0,7				
Ekstraherbar Organisk Fluor *Intern metode Teknik*	<50,0	76,3	<50,0	<50,0	<50,0	µg/kg ts.	100	45	*A
Tørstof *NF ISO 11465 Gravimetrisk*	82,9	80,9	88,1	84,3	91,9	% rw	0,1	5	A

Underleverandør:
A: Underleverandør (COFRAC TESTING 1-1488)

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Rapportnr.:	AR-24-VL-01038135-01
Batchnr.:	EUAA59-24038135
Kundenr.:	VL0002604
Rapportdato:	18.07.2024

Analyserapport

Sagsnr.:	Udvaskning af PFAS	
Sagsnavn:	AAU undvasknings projekt	
Prøvetype:	Jord	
Prøveudtagning:	12.03.2024	
Prøvetager:	Rekvirenten	mblr
Modt. dato:	08.07.2024	
Analyseperiode:	08.07.2024 - 18.07.2024	

Lab prøvenr:	**862-2024-03813506**		**Enhed**	**DL.**	**Urel(%)**	**¤)**
Prøvemærke:	KC2-2					
Prøvedybde m u.t.:	1,4					
Ekstraherbar Organisk Fluor *Intern metode Teknik*	219		µg/kg ts.	100	45	*A
Tørstof *NF ISO 11465 Gravimetrisk*	82,6		% rw	0,1	5	A

Underleverandør:
A: Underleverandør (COFRAC TESTING 1-1488)

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Aalborg Universitet, Esbjerg, Morten Birch Larsen, Niels Bohrs Vej 8, 6700 Esbjerg

18.07.2024

Christina B. Christensen
Christina Bonde Christensen
Kemiker Eurofins VBM Laboratoriet A/S

Tegnforklaring:

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>:	større end	i.p.:	ikke påvist
#:	ingen parametre er påvist	i.m.:	ikke målelig
DL:	Detektionsgrænse	¤):	udført af underleverandør

Urel (%): Ekspanderede relative måleusikkerhed med dækningsfaktor 2. For resultater på detektionsgrænseniveau kan usikkerheden være større end oplyst på rapporten.

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Att.: Nicolai (NPN) Præst Nielsen

Rapportnr.:	AR-24-VL-01058092-02
Batchnr.:	EUAA59-24058092
Kundenr.:	VL0002604
Rapportdato:	03.03.2025
Valideringskode:	482C75CA66

Analyserapport

Sagsnr.:	Udvaskning af PFAS	
Sagsnavn:	AAU udvasknings projekt	
Prøvetype:	Jord	
Prøveudtagning:	12.03.2024	
Prøvetager:	Rekvirenten	mblr
Modt. dato:	17.10.2024	
Analyseperiode:	18.10.2024 - 03.03.2025	

Lab prøvenr:	**862-2024-05809201**	**862-2024-05809202**	**862-2024-05809203**	**862-2024-05809204**	**Enhed**	**DL.**	**Urel(%)**	**¤)**
Prøvemærke:	KA1-2 (1)	KA2-2 (1,2)	KB1-2 (1,6)	KC2-2 (1,6)				
Prøvedybde m u.t.:	1	1,2	1,6	1,6				
Tørstof *SS-EN 12880:2000 mod. Thermo gravimetri*	84,9	81,4	88,1	95,5	%	5	5	A
PFAS-forbindelser								
PFBA (Perfluorbutansyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	3,5	6,8	<2,0	<4,0	µg/kg ts.	2	36	*A
PFBS (Perfluorbutansulfonsyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<0,10	<0,10	<0,10	<0,20	µg/kg ts.	0,1	36	*A
PFPeA (Perfluorpentansyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	9,4	14	<2,0	<4,0	µg/kg ts.	2	36	*A
PFPeS (Perfluorpentansulfonsyre) (TOP *Environ. Sci. Technol. 2012 LC-MS/MS*	0,10	<0,10	<0,10	<0,20	µg/kg ts.	0,1	36	*A
PFHxA (Perfluorhexansyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	15	10	<0,10	0,73	µg/kg ts.	0,1	36	*A
PFHxS (Perfluorhexansulfonsyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	0,38	0,17	<0,10	0,22	µg/kg ts.	0,1	36	*A
PFHpA (Perfluorheptansyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	2,8	2,0	<0,10	<0,20	µg/kg ts.	0,1	36	*A
PFHpS (Perfluorheptansulfonsyre) (TOF *Environ. Sci. Technol. 2012 LC-MS/MS*	<0,10	<0,10	<0,10	<0,20	µg/kg ts.	0,1	36	*A
PFOA (Perfluoroktansyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	0,86	0,15	0,11	<0,20	µg/kg ts.	0,1	36	*A
PFOS (Perfluoroktansulfonsyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	7,7	2,0	<0,10	0,91	µg/kg ts.	0,1	36	*A
6:2 FTS (Fluortelomersulfonat) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<0,10	<0,10	<0,10	<0,20	µg/kg ts.	0,1	36	*A
PFOSA (Perfluoroktansulfonamid) (TOP *Environ. Sci. Technol. 2012 LC-MS/MS*	<0,10	<0,10	<0,10	<0,20	µg/kg ts.	0,1	36	*A
PFNA (Perfluornonansyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<0,10	<0,10	<0,10	<0,20	µg/kg ts.	0,1	36	*A
PFNS (Perfluornonansulfonsyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<0,20	<0,20	<0,20	<0,40	µg/kg ts.	0,2	36	*A
PFDA (Perfluordekansyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<0,10	<0,10	<0,10	<0,20	µg/kg ts.	0,1	36	*A
PFDS (Perfluordekansulfonsyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<0,20	<0,20	<0,20	<0,40	µg/kg ts.	0,2	36	*A
PFUnDA (Perfluorundekansyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<0,20	<0,20	<0,20	<0,40	µg/kg ts.	0,2	36	*A
PFUnDS (Perfluorundecansulfonsyre) (T *Environ. Sci. Technol. 2012 LC-MS/MS*	<0,20	<0,20	<0,20	<0,40	µg/kg ts.	0,2	36	*A
PFDoDA (Perfluordodekansyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<0,20	<0,20	<0,20	<0,40	µg/kg ts.	0,2	36	*A
PFDoDS (Perfluordodecansulfonsyre) (T *Environ. Sci. Technol. 2012 LC-MS/MS*	<1,0	<1,0	<1,0	<2,0	µg/kg ts.	1	36	*A
PFTrDA (Perfluortridecansyre) (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<1,0	<1,0	<1,0	<2,0	µg/kg ts.	1	36	*A
PFTrDS (Perfluortridekansulfonsyre) (TC *Environ. Sci. Technol. 2012 LC-MS/MS*	<1,0	<1,0	<1,0	<2,0	µg/kg ts.	1	36	*A
Sum of PFAS SLV 11 (TOP) incl. ½ LOC *Environ. Sci. Technol. 2012 LC-MS/MS*	40	35	2,5	6,5	µg/kg ts.			*A
Sum af PFAS (TOP) incl. ½ LOQ *Environ. Sci. Technol. 2012 LC-MS/MS*	44	39	6,4	14	µg/kg ts.			*A

Ydelser

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Rapportnr.:	AR-24-VL-01058092-02
Batchnr.:	EUAA59-24058092
Kundenr.:	VL0002604
Rapportdato:	03.03.2025
Valideringskode:	482C75CA66

Analyserapport

Sagsnr.:	Udvaskning af PFAS	
Sagsnavn:	AAU udvasknings projekt	
Prøvetype:	Jord	
Prøveudtagning:	12.03.2024	
Prøvetager:	Rekvirenten	mblr
Modt. dato:	17.10.2024	
Analyseperiode:	18.10.2024 - 03.03.2025	

Lab prøvenr:	**862-2024-05809201**	**862-2024-05809202**	**862-2024-05809203**	**862-2024-05809204**	**Enhed**	**DL.**	**Urel(%)**	**¤)**
Prøvemærke:	KA1-2 (1)	KA2-2 (1,2)	KB1-2 (1,6)	KC2-2 (1,6)				
Prøvedybde m u.t.:	1	1,2	1,6	1,6				
Ekstern rapport sendt	Se bilag: PFAS_70_results (58092+60821)		Se bilag: PFAS_70_results (58092+60821)	Se bilag: PFAS_70_results (58092+60821)				*

Underleverandør:
A: Underleverandør (ISO/IEC 17025:2017 SWEDAC 1977)

05809204 Prøvekommentar:
Der er brugt en lavere prøvevægt grundet dårlig oxidering. Derfor er detektionsgrænsen hævet.

Batchkommentar:
Excel-ark med prøvningsresultaterne medsendes som bilag.
Arkiveringstiden på disse prøver, før igangsættelse, kan have forårsaget tab eller nedbrydning af komponenter.
Vær opmærksom på at den vedhæftede PFAS rapport fra USA indeholder resultater for både batch EUAA59-24058092 og EUAA59-24060821.
Revideret rapport erstatter tidligere fremsendte rapport AR-24-VL-01058092-01. Resultat for PFtrDA, PFPeS, PFNS, PFDoS, PFTrDS og PFUnDS tilføjet.

Kopi til:
Eurofins VBM Laboratoriet A/S, Gry Janniche, Industrivej 1, 9440 AABYBRO
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Aalborg Universitet, Esbjerg, Jette Kjøge Olsen, Niels Bohrs Vej 8, 6700 Esbjerg
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03.03.2025

Andreas Svendsen
Andreas Vestergård Svendsen
Kundecentermedarbejder

Tegnforklaring:

<:	mindre end	*):	Ikke omfattet af akkrediteringen
>:	større end	i.p.:	ikke påvist
#:	ingen parametre er påvist	i.m.:	ikke målelig
DL:	Detektionsgrænse	¤):	udført af underleverandør

Urel (%): Ekspanderede relative måleusikkerhed med dækningsfaktor 2. For resultater på detektionsgrænseniveau kan usikkerheden være større end oplyst på rapporten.

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Rapportnr.: AR-24-VL-01020444-01
Batchnr.: EUAA59-24020444
Kundenr.: VL0002604
Rapportdato: 01.05.2024

Analyserapport

Sagsnavn: Udvaskning af PFAS
Prøvetype: Perkolat
Prøveudtagning: 03.04.2024
Prøvetager: Rekvirenten
Modt. dato: 19.04.2024
Analyseperiode: 19.04.2024 - 01.05.2024

Lab prøvenr:	862-2024-02044401	862-2024-02044402	862-2024-02044403	862-2024-02044404	862-2024-02044405	Enhed	DL.	Urel(%)	¤)
Prøve ID:	1,5	0,75	1,5	0,75	2				
Prøvemærke:	PVA1-1	PVA1-2	PVA2-1	PVA2-2	PVB1-1				
Prøvedybde m u.t.:	1,5	0,75	1,5	0,75	2				
PFAS-forbindelser									
PFBA (Perfluorbutansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	8300	3300	3200	2900	9,4	ng/l	0,6	31	*A
PFBS (Perfluorbutansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	79	20	<10	<10	3,0	ng/l	0,3	31	*A
PFPeA (Perfluorpentansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	79000	28000	24000	22000	1,3	ng/l	0,3	31	*A
PFPeS (Perfluorpentansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	110	35	12	16	0,67	ng/l	0,3	31	*A
PFHxA (Perfluorhexansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	30000	7200	17000	18000	2,1	ng/l	0,3	31	*A
PFHxS (Perfluorhexansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	1900	570	250	510	2,1	ng/l	0,3	31	*A
PFHpA (Perfluorheptansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	7500	2600	2300	2300	1,5	ng/l	0,3	31	*A
PFHpS (Perfluorheptansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	38	35	20	57	0,45	ng/l	0,3	31	*A
PFOA (Perfluoroktansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	330	150	180	320	8,0	ng/l	0,3	31	*A
PFOS (Perfluoroktansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	8800	110	160	2400	4,5	ng/l	0,2	31	*A
6:2 FTS (Fluortelomersulfonat) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	100000	29000	150000	150000	<0,30	ng/l	0,3	31	*A
PFOSA (Perfluoroktansulfonamid) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<10	<10	<10	<10	<0,30	ng/l	0,3	31	*A
PFNA (Perfluornonansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	21	30	48	63	<0,30	ng/l	0,3	31	*A
PFNS (Perfluornonansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<10	<10	<10	<10	<0,30	ng/l	0,3	31	*A
PFDA (Perfluordekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<10	<10	<10	<10	<0,30	ng/l	0,3	31	*A
PFDS (Perflordekanesulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<10	<10	<10	<10	<0,30	ng/l	0,3	31	*A
PFUnDA (Perfluorundekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<10	<10	<10	<10	<0,30	ng/l	0,3	31	*A
PFUnDS (Perfluorundekansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<10	<10	<10	<10	<0,30	ng/l	0,3	31	*A
PFDoDA (Perfluordodekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<10	<10	<10	<10	<0,30	ng/l	0,3	31	*A
PFDoDS (Perfluordodekansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<10	<10	<10	<10	<1,0	ng/l	1	31	*A
PFTrDA (Perfluortridekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<10	<10	<10	<10	<1,0	ng/l	1	31	*A

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Rapportnr.: AR-24-VL-01020444-01
Batchnr.: EUAA59-24020444
Kundenr.: VL0002604
Rapportdato: 01.05.2024

Analyserapport

Sagsnavn: Udvaskning af PFAS
Prøvetype: Perkolat
Prøveudtagning: 03.04.2024
Prøvetager: Rekvirenten
Modt. dato: 19.04.2024
Analyseperiode: 19.04.2024 - 01.05.2024

Lab prøvenr:	**862-2024-02044401**	**862-2024-02044402**	**862-2024-02044403**	**862-2024-02044404**	**862-2024-02044405**	**Enhed**	**DL.**	**Urel(%)**	¤)
Prøve ID:	1,5	0,75	1,5	0,75	2				
Prøvemærke:	PVA1-1	PVA1-2	PVA2-1	PVA2-2	PVB1-1				
Prøvedybde m u.t.:	1,5	0,75	1,5	0,75	2				
PFTrDS (Perfluortridekansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<10	<10	<10	<10	<0,30	ng/l	0,3	31	*A
Sum af PFOA, PFOS, PFNA og PFHxS *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	11000	860	640	3300	15	ng/l			*A
Sum af PFAS *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	240000	71000	200000	200000	33	ng/l			*A

Underleverandør:
A: Underleverandør

02044401 Prøvekommentar:
Detektionsgrænsen er blevet øget på grund af høje niveauer af PFAS i prøven.

02044402 Prøvekommentar:
Detektionsgrænsen er blevet øget på grund af høje niveauer af PFAS i prøven.

02044403 Prøvekommentar:
Detektionsgrænsen er blevet øget på grund af høje niveauer af PFAS i prøven.

02044404 Prøvekommentar:
Detektionsgrænsen er blevet øget på grund af høje niveauer af PFAS i prøven.

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Rapportnr.: AR-24-VL-01020444-01
Batchnr.: EUAA59-24020444
Kundenr.: VL0002604
Rapportdato: 01.05.2024

Analyserapport

Sagsnavn: Udvaskning af PFAS
Prøvetype: Perkolat
Prøveudtagning: 03.04.2024
Prøvetager: Rekvirenten
Modt. dato: 19.04.2024
Analyseperiode: 19.04.2024 - 01.05.2024

Lab prøvenr:	862-2024-02044406	862-2024-02044407	862-2024-02044408	862-2024-02044409	862-2024-02044410	Enhed	DL.	Urel(%)	¤)
Prøve ID:	1	3	2	1,5	0,75				
Prøvemærke:	PVB1-2	PVB2-1	PVB2-2	PVC1-1	PVC1-2				
Prøvedybde m u.t.:	1	3	2	1,5	0,75				
PFAS-forbindelser									
PFBA (Perfluorbutansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,60	<20	2,6	14	10	ng/l	0,6	31	*A
PFBS (Perfluorbutansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	5,7	5,1	ng/l	0,3	31	*A
PFPeA (Perfluorpentansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	1,1	23	16	ng/l	0,3	31	*A
PFPeS (Perfluorpentansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	22	16	ng/l	0,3	31	*A
PFHxA (Perfluorhexansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	1,5	45	45	ng/l	0,3	31	*A
PFHxS (Perfluorhexansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	0,43	<10	0,35	360	240	ng/l	0,3	31	*A
PFHpA (Perfluorheptansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	1,3	7,6	6,8	ng/l	0,3	31	*A
PFHpS (Perfluorheptansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	8,7	5,0	ng/l	0,3	31	*A
PFOA (Perfluoroktansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	3,8	29	26	ng/l	0,3	31	*A
PFOS (Perfluoroktansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,20	4600	8,7	78	150	ng/l	0,2	31	*A
6:2 FTS (Fluortelomersulfonat) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	0,62	0,80	ng/l	0,3	31	*A
PFOSA (Perfluoroktansulfonamid) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	0,44	<0,30	0,40	ng/l	0,3	31	*A
PFNA (Perfluornonansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	0,95	1,4	ng/l	0,3	31	*A
PFNS (Perfluornonansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	<0,30	<0,30	ng/l	0,3	31	*A
PFDA (Perfluordekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	<0,30	<0,30	ng/l	0,3	31	*A
PFDS (Perflordekanesulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	<0,30	<0,30	ng/l	0,3	31	*A
PFUnDA (Perfluorundekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	<0,30	<0,30	ng/l	0,3	31	*A
PFUnDS (Perfluorundekansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	<0,30	<0,30	ng/l	0,3	31	*A
PFDoDA (Perfluordodekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	<0,30	<0,30	ng/l	0,3	31	*A
PFDoDS (Perfluordodekansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<1,0	<10	<1,0	<1,0	<1,0	ng/l	1	31	*A
PFTrDA (Perfluortridekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<1,0	<10	<1,0	<1,0	<1,0	ng/l	1	31	*A

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Rapportnr.: AR-24-VL-01020444-01
Batchnr.: EUAA59-24020444
Kundenr.: VL0002604
Rapportdato: 01.05.2024

Analyserapport

Sagsnavn: Udvaskning af PFAS
Prøvetype: Perkolat
Prøveudtagning: 03.04.2024
Prøvetager: Rekvirenten
Modt. dato: 19.04.2024
Analyseperiode: 19.04.2024 - 01.05.2024

Lab prøvenr:	**862-2024-02044406**	**862-2024-02044407**	**862-2024-02044408**	**862-2024-02044409**	**862-2024-02044410**	**Enhed**	**DL.**	**Urel(%)**	¤)
Prøve ID:	1	3	2	1,5	0,75				
Prøvemærke:	PVB1-2	PVB2-1	PVB2-2	PVC1-1	PVC1-2				
Prøvedybde m u.t.:	1	3	2	1,5	0,75				
PFTrDS (Perfluortridekansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<10	<0,30	<0,30	<0,30	ng/l	0,3	31	*A
Sum af PFOA, PFOS, PFNA og PFHxS *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	0,43	4600	13	470	420	ng/l			*A
Sum af PFAS *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	0,43	4600	20	590	520	ng/l			*A

Underleverandør:
A: Underleverandør

02044407 Prøvekommentar:
Detektionsgrænsen er blevet øget på grund af høje niveauer af PFAS i prøven.

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Rapportnr.: AR-24-VL-01020444-01
Batchnr.: EUAA59-24020444
Kundenr.: VL0002604
Rapportdato: 01.05.2024

Analyserapport

Sagsnavn: Udvaskning af PFAS
Prøvetype: Perkolat
Prøveudtagning: 03.04.2024
Prøvetager: Rekvirenten
Modt. dato: 19.04.2024
Analyseperiode: 19.04.2024 - 01.05.2024

Lab prøvenr:	862-2024-02044411	862-2024-02044412	Enhed	DL.	Urel(%)	¤)
Prøve ID:	1,5	0,75				
Prøvemærke:	PVC2-1	PVC2-2				
Prøvedybde m u.t.:	1,5	0,75				
PFAS-forbindelser						
PFBA (Perfluorbutansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	10	57	ng/l	0,6	31	*A
PFBS (Perfluorbutansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	0,95	0,97	ng/l	0,3	31	*A
PFPeA (Perfluorpentansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	13	60	ng/l	0,3	31	*A
PFPeS (Perfluorpentansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	2,9	2,8	ng/l	0,3	31	*A
PFHxA (Perfluorhexansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	7,6	26	ng/l	0,3	31	*A
PFHxS (Perfluorhexansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	84	44	ng/l	0,3	31	*A
PFHpA (Perfluorheptansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	3,3	8,4	ng/l	0,3	31	*A
PFHpS (Perfluorheptansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	4,0	1,6	ng/l	0,3	31	*A
PFOA (Perfluoroktansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	7,3	13	ng/l	0,3	31	*A
PFOS (Perfluoroktansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	380	64	ng/l	0,2	31	*A
6:2 FTS (Fluortelomersulfonat) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	0,38	ng/l	0,3	31	*A
PFOSA (Perfluoroktansulfonamid) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<0,30	ng/l	0,3	31	*A
PFNA (Perfluornonansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	0,90	1,3	ng/l	0,3	31	*A
PFNS (Perfluornonansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<0,30	ng/l	0,3	31	*A
PFDA (Perfluordekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<0,30	ng/l	0,3	31	*A
PFDS (Perflordekanesulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<0,30	ng/l	0,3	31	*A
PFUnDA (Perfluorundekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<0,30	ng/l	0,3	31	*A
PFUnDS (Perfluorundekansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<0,30	ng/l	0,3	31	*A
PFDoDA (Perfluordodekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<0,30	ng/l	0,3	31	*A
PFDoDS (Perfluordodekansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<1,0	<1,0	ng/l	1	31	*A
PFTrDA (Perfluortridekansyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<1,0	<1,0	ng/l	1	31	*A

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Att.: Jens Muff

Rapportnr.:	AR-24-VL-01020444-01
Batchnr.:	EUAA59-24020444
Kundenr.:	VL0002604
Rapportdato:	01.05.2024

Analyserapport

Sagsnavn:	Udvaskning af PFAS
Prøvetype:	Perkolat
Prøveudtagning:	03.04.2024
Prøvetager:	Rekvirenten
Modt. dato:	19.04.2024
Analyseperiode:	19.04.2024 - 01.05.2024

Lab prøvenr:	**862-2024-02044411**	**862-2024-02044412**	**Enhed**	**DL.**	**Urel(%)**	**¤)**
Prøve ID:	1,5	0,75				
Prøvemærke:	PVC2-1	PVC2-2				
Prøvedybde m u.t.:	1,5	0,75				
PFTrDS (Perfluortridekansulfonsyre) *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	<0,30	<0,30	ng/l	0,3	31	*A
Sum af PFOA, PFOS, PFNA og PFHxS *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	470	120	ng/l			*A
Sum af PFAS *DIN38407-42, UNEP Chemicals Branch 2015 mod. LC-MS/MS*	510	280	ng/l			*A

Underleverandør:
A: Underleverandør

Kopi til:
Aalborg Universitet, Esbjerg, Hans-Christian Greve Eurofins, Niels Bohrs Vej 8, 6700 Esbjerg
Aalborg Universitet, Esbjerg, Jette Kjøge Olsen, Niels Bohrs Vej 8, 6700 Esbjerg
Aalborg Universitet, Esbjerg, Linda Madsen, Niels Bohrs Vej 8, 6700 Esbjerg

01.05.2024

Christina B. Christensen
Christina Bonde Christensen
Kemiker Eurofins VBM Laboratoriet A/S

Tegnforklaring:

<:	mindre end	*):	Ikke omfattet af akkrediteringen
>:	større end	i.p.:	ikke påvist
#:	ingen parametre er påvist	i.m.:	ikke målelig
DL:	Detektionsgrænse	¤):	udført af underleverandør

Urel (%): Ekspanderede relative måleusikkerhed med dækningsfaktor 2. For resultater på detektionsgrænseniveau kan usikkerheden være større end oplyst på rapporten.

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Rapportnr.: AR-24-VL-01038134-01
Batchnr.: EUAA59-24038134
Kundenr.: VL0002604
Rapportdato: 12.09.2024

Analyserapport

Sagsnr.:	Udvaskning af PFAS	
Sagsnavn:	AAU udvasknings projekt	
Prøvetype:	Perkolat	
Prøveudtagning:	03.04.2024	
Prøvetager:	Rekvirenten	mblr
Modt. dato:	08.07.2024	
Analyseperiode:	08.07.2024 - 12.09.2024	

Lab prøvenr:	**862-2024-03813401**	**862-2024-03813402**	**862-2024-03813403**	**862-2024-03813404**	**862-2024-03813405**	**Enhed**	**DL.**	**Urel(%)**	**¤)**
Prøvemærke:	PVA1-2	PVA2-1	PVB1-1	PVB2-1	PVC1-2				
Prøvedybde m u.t.:	0,75	1,5	2	3	0,75				
Organiske samleparametre									
AOF (Adsorberbar Organisk Fluor) *Internal Method SAA-H-AOF.010: 2018-11 IC-EC*	0,069	0,15	< 0,012	< 0,012	< 0,012	mg/l	0,001	30	A
Prøveforberedelse									
Fluorid *DIN EN ISO 10304-1 (D20): 2009-07 IC-EC*	< 2,0	< 2,0	< 2,0	< 2,0	< 2,0	mg/l	2	12,14	A

Underleverandør:
A: Underleverandør (DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00)

03813403 Prøvekommentar:
Detektionsgrænsen måtte hæves, da der ikke var tilstrækkeligt prøvemateriale til at gentage analysen.

03813404 Prøvekommentar:
Detektionsgrænsen måtte hæves, da der ikke var tilstrækkeligt prøvemateriale til at gentage analysen.

03813405 Prøvekommentar:
Detektionsgrænsen måtte hæves pga. matricen.

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6700 Esbjerg
Att.: Jens Muff

Rapportnr.:	AR-24-VL-01038134-01
Batchnr.:	EUAA59-24038134
Kundenr.:	VL0002604
Rapportdato:	12.09.2024

Analyserapport

Sagsnr.:	Udvaskning af PFAS	
Sagsnavn:	AAU udvasknings projekt	
Prøvetype:	Perkolat	
Prøveudtagning:	03.04.2024	
Prøvetager:	Rekvirenten	mblr
Modt. dato:	08.07.2024	
Analyseperiode:	08.07.2024 - 12.09.2024	

Lab prøvenr:	**862-2024-03813406**	**Enhed**	**DL.**	**Urel(%)**	**¤)**
Prøvemærke:	PVC2-1				
Prøvedybde m u.t.:	1,5				
Organiske samleparametre					
AOF (Adsorberbar Organisk Fluor) *Internal Method SAA-H-AOF.010: 2018-11 IC-EC*	< 0,012	mg/l	0,001	30	A
Prøveforberedelse					
Fluorid *DIN EN ISO 10304-1 (D20): 2009-07 IC-EC*	< 2,0	mg/l	2	12,14	A

Underleverandør:
A: Underleverandør (DIN EN ISO/IEC 17025:2018 DAkkS D-PL-14081-01-00)

03813406 Prøvekommentar:
Detektionsgrænsen måtte hæves pga. matricen.

Batchkommentar:
Excel-ark med prøvningsresultaterne medsendes som bilag.

Kopi til:
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Aalborg Universitet, Esbjerg, Morten Birch Larsen, Niels Bohrs Vej 8, 6700 Esbjerg

12.09.2024

Christina B. Christensen
Christina Bonde Christensen
Kemiker Eurofins VBM Laboratoriet A/S

Tegnforklaring:

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>:	større end	i.p.:	ikke påvist
#:	ingen parametre er påvist	i.m.:	ikke målelig
DL:	Detektionsgrænse	¤):	udført af underleverandør

Urel (%): Ekspanderede relative måleusikkerhed med dækningsfaktor 2. For resultater på detektionsgrænseniveau kan usikkerheden være større end oplyst på rapporten.

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Att.: Nicolai (NPN) Præst Nielsen

Rapportnr.:	AR-24-VL-01060821-02
Batchnr.:	EUAA59-24060821
Kundenr.:	VL0002604
Rapportdato:	03.03.2025
Valideringskode:	5D182836FE

Analyserapport

Sagsnr.:	Udvaskning af PFAS	
Sagsnavn:	AAU udvasknings projekt	
Prøvetype:	Perkolat	
Prøveudtagning:	12.03.2024	
Prøvetager:	Rekvirenten	mblr
Modt. dato:	28.10.2024	
Analyseperiode:	18.10.2024 - 03.03.2025	

Lab prøvenr:	**862-2024-06082101**	**862-2024-06082102**	**862-2024-06082103**	**Enhed**	**DL.**	**Urel(%)**	**¤)**
Prøvemærke:	PVA1-2	PVB1-1	PVC2-1				
Prøvedybde m u.t.:	0,75	2	1,5				
P37DMOA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<1000	<20	<1000	ng/l	2	31	*A
HPFHpA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A
PFHxDA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A
4:2 FTS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A
Sum PFAS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	66000	20	410	ng/l	0,3		*A
8:2 FTS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<20	<3,0	<20	ng/l	0,3	31	*A
Sum PFAS SLV 11 (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	66000	20	410	ng/l	0,3		*A
PFUnDS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	1	31	*A
PFTrDS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	1	31	*A
PFAS-forbindelser							
PFBA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	10000	7,2	<20	ng/l	0,6	31	*A
PFBS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	12	<3,0	<10	ng/l	0,3	31	*A
PFPeA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	42000	<3,0	14	ng/l	0,3	31	*A
PFPeS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	38	<3,0	<10	ng/l	0,3	31	*A
PFHxA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	9500	5,1	77	ng/l	0,3	31	*A
PFHxS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	660	<3,0	69	ng/l	0,3	31	*A
PFHpA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	2500	<3,0	<10	ng/l	0,3	31	*A
PFHpS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	53	<3,0	<10	ng/l	0,3	31	*A
PFOA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	140	3,6	<10	ng/l	0,3	31	*A
PFOS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	1500	3,8	250	ng/l	0,2	31	*A
6:2 FTS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A
PFOSA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A
PFNA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	41	<3,0	<10	ng/l	0,3	31	*A
PFNS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A
PFDA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A
PFDS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A
PFUnDA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A

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Att.: Nicolai (NPN) Præst Nielsen

Rapportnr.:	AR-24-VL-01060821-02
Batchnr.:	EUAA59-24060821
Kundenr.:	VL0002604
Rapportdato:	03.03.2025
Valideringskode:	5D182836FE

Analyserapport

Sagsnr.:	Udvaskning af PFAS	
Sagsnavn:	AAU udvasknings projekt	
Prøvetype:	Perkolat	
Prøveudtagning:	12.03.2024	
Prøvetager:	Rekvirenten	mblr
Modt. dato:	28.10.2024	
Analyseperiode:	18.10.2024 - 03.03.2025	

Lab prøvenr:	**862-2024-06082101**	**862-2024-06082102**	**862-2024-06082103**	**Enhed**	**DL.**	**Urel(%)**	**¤)**
Prøvemærke:	PVA1-2	PVB1-1	PVC2-1				
Prøvedybde m u.t.:	0,75	2	1,5				
PFDoDA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A
PFDoDS (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	1	31	*A
PFTrDA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A
PFTeDA (TOP) *Environ. Sci. Technol. 2012 LC-MS/MS*	<10	<3,0	<10	ng/l	0,3	31	*A
Ydelser							
Ekstern rapport sendt	Se bilag: PFAS_70_results (58092+60821)	Se bilag: PFAS_70_results (58092+60821)	Se bilag: PFAS_70_results (58092+60821)				*

Underleverandør:
A: Underleverandør

06082101 Prøvekommentar:
Kvantificeringsgrænsen er blevet hævet grundet højt indhold af PFAS forbindelser i prøven.

06082102 Prøvekommentar:
Kvantificeringsgrænsen er hævet grundet nødvendig fortynding inden analysen for at oxidere prøven.

06082103 Prøvekommentar:
Kvantificeringsgrænsen er blevet hævet, da den indsendte volumen var for lav til oprensning med solid phase ekstrahering.

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Batchnr.:	EUAA59-24060821
Kundenr.:	VL0002604
Rapportdato:	03.03.2025
Valideringskode:	5D182836FE

Analyserapport

Sagsnr.:	Udvaskning af PFAS	
Sagsnavn:	AAU udvasknings projekt	
Prøvetype:	Perkolat	
Prøveudtagning:	12.03.2024	
Prøvetager:	Rekvirenten	mblr
Modt. dato:	28.10.2024	
Analyseperiode:	18.10.2024 - 03.03.2025	

Lab prøvenr:	**862-2024-06082101**	**862-2024-06082102**	**862-2024-06082103**	**Enhed**	**DL.**	**Urel(%)** ¤)
Prøvemærke:	PVA1-2	PVB1-1	PVC2-1			
Prøvedybde m u.t.:	0,75	2	1,5			

Batchkommentar:

Excel-ark med prøvningsresultaterne medsendes som bilag.
Vær opmærksom på at den vedhæftede PFAS rapport fra USA indeholder resultater for både batch EUAA59-24058092 og EUAA59-24060821.
Revideret rapport erstatter tidligere fremsendte rapport AR-24-VL-01060821-01. Resultat for PFtrDA, PFPeS, PFNS, PFDoS, PFTrDS og PFUnDS tilføjet.

Kopi til:

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Aalborg Universitet, Esbjerg, Morten Birch Larsen, Niels Bohrs Vej 8, 6700 Esbjerg

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03.03.2025

Andreas Svendsen

Andreas Vestergård Svendsen
Kundecentermedarbejder

Tegnforklaring:

<:	mindre end	*):	Ikke omfattet af akkrediteringen
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#:	ingen parametre er påvist	i.m.:	ikke målelig
DL:	Detektionsgrænse	¤):	udført af underleverandør

Urel (%): Ekspanderede relative måleusikkerhed med dækningsfaktor 2. For resultater på detektionsgrænseniveau kan usikkerheden være større end oplyst på rapporten.

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ANALYTICAL REPORT

PREPARED FOR

Attn: Hans-Christian Greve
Eurofins VBM Laboratoriet A/S
Industrivej 1
Aabybro, Denmark DK-9440

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JOB DESCRIPTION

AAUe udvaskningsprojekt

JOB NUMBER

410-196590-1

Eurofins Lancaster Laboratories Environment Testing, LLC
2425 New Holland Pike
Lancaster PA 17601

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization

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12/16/2024 4:52:07 PM
Revision 1

Authorized for release by
Dana Kauffman, Project Manager
Dana.Kauffman@et.eurofinsus.com
(717)556-7219

Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Table of Contents

Qualifiers

LCMS

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
*1	LCS/LCSD RPD exceeds control limits.
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
B	Compound was found in the blank and sample.
cn	Refer to Case Narrative for further detail
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-196590-1 — Eurofins Lancaster Laboratories Environment

Job Narrative
410-196590-1

REVISION

The report being provided is a revision of the original report sent on 11/20/2024. The report (revision 1) is being revised due to Report solid samples.

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 11/14/2024 12:00 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 15.9°C.

Receipt Exceptions
The following samples were received at the laboratory outside the required temperature criteria: KA1-2, 1/58092-1 (410-196590-1), KA1-2 1,6/58092-3 (410-196590-2), KA1-2, 1,6/58092-4 (410-196590-3), PVA1-20, 75/60821-1 (410-196590-4), PVB1-1, 1/60821-2 (410-196590-5) and PVC2-1, 1,5/60821-3 (410-196590-6). There was no cooling media present in the cooler. The client was contacted regarding this issue, and the laboratory was instructed to proceed with analysis

The following samples were received at the laboratory without a sample collection time documented on the chain of custody: KA1-2, 1/58092-1 (410-196590-1), KA1-2 1,6/58092-3 (410-196590-2), KA1-2, 1,6/58092-4 (410-196590-3), PVA1-20, 75/60821-1 (410-196590-4), PVB1-1, 1/60821-2 (410-196590-5) and PVC2-1, 1,5/60821-3 (410-196590-6). Entered as 00:00.

PFAS
Method PFC_IDA: The recovery for labeled isotope: d5-NEtFOSAA is outside the QC acceptance limits in the opening and closing continuing calibration verification standards, biased high. Since the recovery for the labeled isotope is within QC limits in the following samples: KA1-2, 1/58092-1 (410-196590-1), KA1-2 1,6/58092-3 (410-196590-2) and KA1-2, 1,6/58092-4 (410-196590-3), the data is reported.

Method PFC_IDA: Target analyte(s) Perfluorooctanesulfonic acid (PFOS) were detected in the method blank associated with the following samples: KA1-2, 1/58092-1 (410-196590-1) and KA1-2, 1,6/58092-4 (410-196590-3). Since the result in the sample is >10X the result in the method blank, the data is reported.

Method PFC_IDA: Target analyte(s) Perfluorooctanesulfonic acid (PFOS) were detected in the method blank associated with the following samples: KA1-2 1,6/58092-3 (410-196590-2). Since the result in the sample is ND, the data is reported.

Method PFC_IDA: The following samples were analyzed outside of analytical holding time due to laboratory error: KA1-2, 1/58092-1 (410-196590-1), KA1-2 1,6/58092-3 (410-196590-2) and KA1-2, 1,6/58092-4 (410-196590-3).

Method PFC_IDA: The recovery for target analyte: Perfluoro-4-isopropoxybutanoic acid (PFIpOBA) in the initial calibration verification standard (ICV) associated with the following samples: KA1-2, 1/58092-1 (410-196590-1), KA1-2 1,6/58092-3 (410-196590-2) and KA1-2, 1,6/58092-4 (410-196590-3) is outside of QC acceptance limits, biased high. Since the recovery is high and the native analyte is not detected in the sample(s), the result is reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample ID: KA1-2, 1/58092-1 — Lab Sample ID: 410-196590-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	5.6	H B cn	0.068	0.040	ng/g	1	☼	537 IDA	Total/NA
Perfluoropentanoic acid (PFPeA)	5.1	H cn	0.068	0.027	ng/g	1	☼	537 IDA	Total/NA
Perfluoropentanesulfonic acid (PFPeS)	0.056	J H cn	0.068	0.025	ng/g	1	☼	537 IDA	Total/NA
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	0.43	H cn	0.11	0.056	ng/g	1	☼	537 IDA	Total/NA
Perfluorohexanoic acid (PFHxA)	1.8	H cn	0.068	0.022	ng/g	1	☼	537 IDA	Total/NA
Perfluorooctanoic acid (PFOA)	0.061	J H cn	0.068	0.025	ng/g	1	☼	537 IDA	Total/NA
Perfluorodecanesulfonic acid (PFDS)	0.047	J H cn	0.068	0.024	ng/g	1	☼	537 IDA	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.44	H cn	0.068	0.022	ng/g	1	☼	537 IDA	Total/NA
Perfluorobutanoic acid (PFBA)	0.68	H cn	0.068	0.027	ng/g	1	☼	537 IDA	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.9	H cn	0.068	0.027	ng/g	1	☼	537 IDA	Total/NA
Perfluorononanoic acid (PFNA)	0.057	J H cn	0.068	0.026	ng/g	1	☼	537 IDA	Total/NA
Perfluoropropionic acid (PFPrA)	0.30	J H cn	0.57	0.23	ng/g	1	☼	537 IDA	Total/NA
Perfluoropropanesulfonic acid (PFPrS)	0.034	J H cn	0.068	0.024	ng/g	1	☼	537 IDA	Total/NA
Perfluorooctanesulfonamide (PFOSAm)	0.054	J H cn	0.068	0.024	ng/g	1	☼	537 IDA	Total/NA

Client Sample ID: KA1-2 1,6/58092-3 — Lab Sample ID: 410-196590-2

No Detections.

Client Sample ID: KA1-2, 1,6/58092-4 — Lab Sample ID: 410-196590-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	1.6	H I B cn	0.062	0.036	ng/g	1	☼	537 IDA	Total/NA
Perfluorooctanoic acid (PFOA)	0.050	J H cn	0.062	0.023	ng/g	1	☼	537 IDA	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.19	H cn	0.062	0.020	ng/g	1	☼	537 IDA	Total/NA
Perfluoroheptanesulfonic acid (PFHpS)	0.062	H cn	0.062	0.021	ng/g	1	☼	537 IDA	Total/NA

Client Sample ID: PVA1-20, 75/60821-1 — Lab Sample ID: 410-196590-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	1400		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	21000		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	31000		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	6500		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
Perfluorobutanoic acid (PFBA)	2800		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2000		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
Perfluoropropionic acid (PFPrA)	1100		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA

Client Sample ID: PVB1-1, 1/60821-2 — Lab Sample ID: 410-196590-5

No Detections.

Client Sample ID: PVC2-1, 1,5/60821-3 — Lab Sample ID: 410-196590-6

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: KA1-2, 1/58092-1
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-1
Matrix: Solid
Percent Solids: 87.0

Method: EPA 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NVHOS	<0.024	H cn	0.068	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<0.023	H cn	0.068	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	<0.025	H cn	0.068	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro-2-(perfluoromethoxy)propanoic acid (PMPA)	<0.021	H cn	0.068	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<0.23	H cn	1.1	0.23	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	<0.022	H cn	0.068	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.027	H cn	0.068	0.027	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.014	H cn	0.068	0.014	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	<0.023	H cn	0.068	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorooctanesulfonic acid (PFOS)	**5.6**	**H B cn**	0.068	0.040	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoroundecanoic acid (PFUnA)	<0.064	H cn	0.11	0.064	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.035	H cn	0.068	0.035	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
R-PSDA	<0.034	H cn	0.068	0.034	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Hydrolyzed PSDA	<0.023	H cn	0.068	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
R-PSDCA	<0.025	H cn	0.068	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
R-EVE	<0.023	H cn	0.068	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	<0.026	H cn	0.068	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro-2-(perfluoroethoxy)propionic acid (PEPA)	<0.023	H cn	0.068	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoropentanoic acid (PFPeA)	**5.1**	**H cn**	0.068	0.027	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoropentanesulfonic acid (PFPeS)	**0.056**	**J H cn**	0.068	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	**0.43**	**H cn**	0.11	0.056	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
8:2 FTCA	<0.018	H cn	0.068	0.018	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
PS Acid	<0.057	H cn	0.11	0.057	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.025	H cn	0.068	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorohexanoic acid (PFHxA)	**1.8**	**H cn**	0.068	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorododecanoic acid (PFDoA)	<0.026	H cn	0.068	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	<0.035	H cn	0.068	0.035	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorooctanoic acid (PFOA)	**0.061**	**J H cn**	0.068	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorodecanoic acid (PFDA)	<0.027	H cn	0.068	0.027	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorodecanesulfonic acid (PFDS)	**0.047**	**J H cn**	0.068	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorohexanesulfonic acid (PFHxS)	**0.44**	**H cn**	0.068	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<0.023	H cn	0.068	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorobutanoic acid (PFBA)	**0.68**	**H cn**	0.068	0.027	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1

Client Sample ID: KA1-2, 1/58092-1
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-1
Matrix: Solid
Percent Solids: 87.0

Method: EPA 537 IDA - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	<0.41	H cn	0.91	0.41	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoroheptanoic acid (PFHpA)	**3.9**	**H cn**	0.068	0.027	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.023	H cn	0.068	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorononanoic acid (PFNA)	**0.057**	**J H cn**	0.068	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorotetradecanoic acid (PFTeDA)	<0.027	H cn	0.068	0.027	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.026	H cn	0.068	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<0.019	H cn	0.068	0.019	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	<0.018	H cn	0.068	0.018	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	<0.023	H cn	0.068	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	<0.022	H cn	0.068	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DA)	<0.027	H cn	0.068	0.027	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	<0.028	H cn	0.068	0.028	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoropropionic acid (PFPrA)	**0.30**	**J H cn**	0.57	0.23	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoropropanesulfonic acid (PFPrS)	**0.034**	**J H cn**	0.068	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
6:2 FTCA	<0.015	H cn	0.068	0.015	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
10:2 FTCA	<0.022	H cn	0.068	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro-2-methoxyacetic acid (PFMOAA)	<0.018	H cn	0.068	0.018	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.015	H cn	0.068	0.015	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorononanesulfonic acid (PFNS)	<0.025	H cn	0.068	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
EVE Acid	<0.057	H cn	0.11	0.057	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
8:2 FTUCA	<0.035	H cn	0.068	0.035	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
6:2 FTUCA	<0.031	H cn	0.068	0.031	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
10:2 FTUCA	<0.036	H cn	0.068	0.036	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorotridecanoic acid (PFTrDA)	<0.024	H cn	0.068	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Hydro-PS Acid	<0.027	H cn	0.068	0.027	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorooctanesulfonamide (PFOSAm)	**0.054**	**J H cn**	0.068	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<0.027	H cn	0.068	0.027	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<0.019	H cn	0.068	0.019	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<0.025	H cn	0.068	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Hydro-EVE Acid	<0.023	H cn	0.068	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluorododecanesulfonic acid (PFDoS)	<0.023	H cn	0.068	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	<0.027	H cn	0.068	0.027	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<0.018	H cn	0.068	0.018	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.025	H cn	0.068	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1

Client Sample ID: KA1-2, 1/58092-1

Lab Sample ID: 410-196590-1

Date Collected: 10/21/24 00:00
Matrix: Solid
Date Received: 11/14/24 12:00
Percent Solids: 87.0

Method: EPA 537 IDA - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<0.022	H cn	0.068	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	<0.025	H cn	0.068	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1
MTP	<0.019	H cn	0.068	0.019	ng/g	☼	12/04/24 15:43	12/09/24 11:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d5-NEtFOSAA	*84*	*cn*	*10 - 188*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
d3-NMeFOSAA	*66*	*cn*	*10 - 172*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C3-HFPO-DA	*71*	*cn*	*17 - 147*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
d7-N-MeFOSE-M	*38*	*cn*	*10 - 177*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
d9-N-EtFOSE-M	*42*	*cn*	*10 - 168*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C2-6:2 FTS	*87*	*cn*	*10 - 200*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C2-8:2 FTS	*96*	*cn*	*10 - 200*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C3-PFBS	*83*	*cn*	*31 - 166*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C2-4:2 FTS	*91*	*cn*	*10 - 190*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C5-PFHxA	*82*	*cn*	*20 - 150*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C9-PFNA	*86*	*cn*	*27 - 159*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C6-PFDA	*84*	*cn*	*25 - 152*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C7-PFUnA	*93*	*cn*	*12 - 169*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C3-PFHxS	*81*	*cn*	*26 - 155*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C2-PFDoA	*97*	*cn*	*10 - 164*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
d5-NEtPFOSA	*17*	*cn*	*10 - 149*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
d3-NMePFOSA	*14*	*cn*	*10 - 150*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C-6:2 FTCA	*50*	*cn*	*10 - 162*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C-8:2 FTCA	*52*	*cn*	*10 - 166*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C-10:2 FTCA	*57*	*cn*	*10 - 178*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C-6:2 FTUCA	*74*	*cn*	*10 - 168*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C-8:2 FTUCA	*71*	*cn*	*10 - 173*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C-10:2 FTUCA	*78*	*cn*	*10 - 181*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C4-PFBA	*76*	*cn*	*25 - 147*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C5-PFPeA	*78*	*cn*	*17 - 154*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C4-PFHpA	*86*	*cn*	*20 - 158*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C8-PFOA	*81*	*cn*	*28 - 148*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C8-PFOS	*86*	*cn*	*34 - 153*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C8-PFOSA	*46*	*cn*	*13 - 151*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C2-PFTeDA	*86*	*cn*	*10 - 165*	*12/04/24 15:43*	*12/09/24 11:28*	*1*
13C3-PFPrA	*74*	*cn*	*10 - 158*	*12/04/24 15:43*	*12/09/24 11:28*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (EPA Moisture)	**13.0**		1.0	1.0	%			11/15/24 09:08	1

Client Sample ID: KA1-2 1,6/58092-3

Lab Sample ID: 410-196590-2

Date Collected: 10/21/24 00:00
Matrix: Solid
Date Received: 11/14/24 12:00
Percent Solids: 91.2

Method: EPA 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NVHOS	<0.023	H cn	0.066	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<0.022	H cn	0.066	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1

Client: Eurofins VBM Laboratoriet A/S
Project/Site: AAUe udvaskningsprojekt

Job ID: 410-196590-1

Client Sample ID: KA1-2 1,6/58092-3
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-2
Matrix: Solid
Percent Solids: 91.2

Method: EPA 537 IDA - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	<0.024	H cn	0.066	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro-2-(perfluoromethoxy)propanoic acid (PMPA)	<0.020	H cn	0.066	0.020	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<0.22	H cn	1.1	0.22	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	<0.021	H cn	0.066	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.026	H cn	0.066	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.013	H cn	0.066	0.013	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	<0.022	H cn	0.066	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorooctanesulfonic acid (PFOS)	<0.038	H cn	0.066	0.038	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoroundecanoic acid (PFUnA)	<0.061	H cn	0.11	0.061	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.034	H cn	0.066	0.034	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
R-PSDA	<0.033	H cn	0.066	0.033	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Hydrolyzed PSDA	<0.022	H cn	0.066	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
R-PSDCA	<0.024	H cn	0.066	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
R-EVE	<0.022	H cn	0.066	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	<0.025	H cn	0.066	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro-2-(perfluoroethoxy)propionic acid (PEPA)	<0.022	H cn	0.066	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoropentanoic acid (PFPeA)	<0.026	H cn	0.066	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoropentanesulfonic acid (PFPeS)	<0.024	H cn	0.066	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<0.054	H cn	0.11	0.054	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
8:2 FTCA	<0.017	H cn	0.066	0.017	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
PS Acid	<0.055	H cn	0.11	0.055	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.024	H cn	0.066	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorohexanoic acid (PFHxA)	<0.021	H cn	0.066	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorododecanoic acid (PFDoA)	<0.025	H cn	0.066	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	<0.034	H cn	0.066	0.034	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorooctanoic acid (PFOA)	<0.024	H cn	0.066	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorodecanoic acid (PFDA)	<0.026	H cn	0.066	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorodecanesulfonic acid (PFDS)	<0.023	H cn	0.066	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorohexanesulfonic acid (PFHxS)	<0.021	H cn	0.066	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<0.022	H cn	0.066	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorobutanoic acid (PFBA)	<0.026	H cn	0.066	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorobutanesulfonic acid (PFBS)	<0.40	H cn	0.87	0.40	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoroheptanoic acid (PFHpA)	<0.026	H cn	0.066	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.022	H cn	0.066	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorononanoic acid (PFNA)	<0.025	H cn	0.066	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorotetradecanoic acid (PFTeDA)	<0.026	H cn	0.066	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1

Client Sample ID: KA1-2 1,6/58092-3
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-2
Matrix: Solid
Percent Solids: 91.2

Method: EPA 537 IDA - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.025	H cn	0.066	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<0.019	H cn	0.066	0.019	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	<0.017	H cn	0.066	0.017	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	<0.022	H cn	0.066	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	<0.021	H cn	0.066	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DA)	<0.026	H cn	0.066	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	<0.027	H cn	0.066	0.027	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoropropionic acid (PFPrA)	<0.22	H cn	0.55	0.22	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoropropanesulfonic acid (PFPrS)	<0.023	H cn	0.066	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
6:2 FTCA	<0.014	H cn	0.066	0.014	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
10:2 FTCA	<0.021	H cn	0.066	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro-2-methoxyacetic acid (PFMOAA)	<0.017	H cn	0.066	0.017	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.014	H cn	0.066	0.014	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorononanesulfonic acid (PFNS)	<0.024	H cn	0.066	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
EVE Acid	<0.055	H cn	0.11	0.055	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
8:2 FTUCA	<0.034	H cn	0.066	0.034	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
6:2 FTUCA	<0.029	H cn	0.066	0.029	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
10:2 FTUCA	<0.035	H cn	0.066	0.035	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorotridecanoic acid (PFTrDA)	<0.023	H cn	0.066	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Hydro-PS Acid	<0.026	H cn	0.066	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorooctanesulfonamide (PFOSAm)	<0.023	H cn	0.066	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<0.026	H cn	0.066	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<0.019	H cn	0.066	0.019	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<0.024	H cn	0.066	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Hydro-EVE Acid	<0.022	H cn	0.066	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluorododecanesulfonic acid (PFDoS)	<0.022	H cn	0.066	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	<0.026	H cn	0.066	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<0.017	H cn	0.066	0.017	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.024	H cn	0.066	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<0.021	H cn	0.066	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	<0.024	H cn	0.066	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1
MTP	<0.019	H cn	0.066	0.019	ng/g	☼	12/04/24 15:43	12/09/24 11:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d5-NEtFOSAA	*66*	*cn*	*10 - 188*	*12/04/24 15:43*	*12/09/24 11:41*	*1*

Client Sample ID: KA1-2 1,6/58092-3

Lab Sample ID: 410-196590-2
Date Collected: 10/21/24 00:00
Matrix: Solid
Date Received: 11/14/24 12:00
Percent Solids: 91.2

Method: EPA 537 IDA - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d3-NMeFOSAA	42	cn	10 - 172	12/04/24 15:43	12/09/24 11:41	1
13C3-HFPO-DA	89	cn	17 - 147	12/04/24 15:43	12/09/24 11:41	1
d7-N-MeFOSE-M	114	cn	10 - 177	12/04/24 15:43	12/09/24 11:41	1
d9-N-EtFOSE-M	105	cn	10 - 168	12/04/24 15:43	12/09/24 11:41	1
13C2-6:2 FTS	87	cn	10 - 200	12/04/24 15:43	12/09/24 11:41	1
13C2-8:2 FTS	99	cn	10 - 200	12/04/24 15:43	12/09/24 11:41	1
13C3-PFBS	108	cn	31 - 166	12/04/24 15:43	12/09/24 11:41	1
13C2-4:2 FTS	97	cn	10 - 190	12/04/24 15:43	12/09/24 11:41	1
13C5-PFHxA	99	cn	20 - 150	12/04/24 15:43	12/09/24 11:41	1
13C9-PFNA	102	cn	27 - 159	12/04/24 15:43	12/09/24 11:41	1
13C6-PFDA	103	cn	25 - 152	12/04/24 15:43	12/09/24 11:41	1
13C7-PFUnA	115	cn	12 - 169	12/04/24 15:43	12/09/24 11:41	1
13C3-PFHxS	99	cn	26 - 155	12/04/24 15:43	12/09/24 11:41	1
13C2-PFDoA	110	cn	10 - 164	12/04/24 15:43	12/09/24 11:41	1
d5-NEtPFOSA	86	cn	10 - 149	12/04/24 15:43	12/09/24 11:41	1
d3-NMePFOSA	87	cn	10 - 150	12/04/24 15:43	12/09/24 11:41	1
13C-6:2 FTCA	34	cn	10 - 162	12/04/24 15:43	12/09/24 11:41	1
13C-8:2 FTCA	36	cn	10 - 166	12/04/24 15:43	12/09/24 11:41	1
13C-10:2 FTCA	38	cn	10 - 178	12/04/24 15:43	12/09/24 11:41	1
13C-6:2 FTUCA	86	cn	10 - 168	12/04/24 15:43	12/09/24 11:41	1
13C-8:2 FTUCA	94	cn	10 - 173	12/04/24 15:43	12/09/24 11:41	1
13C-10:2 FTUCA	92	cn	10 - 181	12/04/24 15:43	12/09/24 11:41	1
13C4-PFBA	100	cn	25 - 147	12/04/24 15:43	12/09/24 11:41	1
13C5-PFPeA	100	cn	17 - 154	12/04/24 15:43	12/09/24 11:41	1
13C4-PFHpA	103	cn	20 - 158	12/04/24 15:43	12/09/24 11:41	1
13C8-PFOA	99	cn	28 - 148	12/04/24 15:43	12/09/24 11:41	1
13C8-PFOS	108	cn	34 - 153	12/04/24 15:43	12/09/24 11:41	1
13C8-PFOSA	99	cn	13 - 151	12/04/24 15:43	12/09/24 11:41	1
13C2-PFTeDA	97	cn	10 - 165	12/04/24 15:43	12/09/24 11:41	1
13C3-PFPrA	76	cn	10 - 158	12/04/24 15:43	12/09/24 11:41	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (EPA Moisture)	8.8		1.0	1.0	%			11/15/24 09:08	1

Client Sample ID: KA1-2, 1,6/58092-4

Lab Sample ID: 410-196590-3
Date Collected: 10/21/24 00:00
Matrix: Solid
Date Received: 11/14/24 12:00
Percent Solids: 96.3

Method: EPA 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NVHOS	<0.022	H cn	0.062	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<0.021	H cn	0.062	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	<0.023	H cn	0.062	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro-2-(perfluoromethoxy)propanoic acid (PMPA)	<0.019	H cn	0.062	0.019	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<0.21	H cn	1.0	0.21	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1

Client Sample ID: KA1-2, 1,6/58092-4
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-3
Matrix: Solid
Percent Solids: 96.3

Method: EPA 537 IDA - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	<0.020	H cn	0.062	0.020	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.025	H cn	0.062	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.012	H cn	0.062	0.012	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	<0.021	H cn	0.062	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**	**H I B cn**	0.062	0.036	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoroundecanoic acid (PFUnA)	<0.058	H cn	0.10	0.058	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.032	H cn	0.062	0.032	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
R-PSDA	<0.031	H cn	0.062	0.031	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Hydrolyzed PSDA	<0.021	H cn	0.062	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
R-PSDCA	<0.023	H cn	0.062	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
R-EVE	<0.021	H cn	0.062	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	<0.024	H cn	0.062	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro-2-(perfluoroethoxy)propionic acid (PEPA)	<0.021	H cn	0.062	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoropentanoic acid (PFPeA)	<0.025	H cn	0.062	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoropentanesulfonic acid (PFPeS)	<0.023	H cn	0.062	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<0.051	H cn	0.10	0.051	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
8:2 FTCA	<0.016	H cn	0.062	0.016	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
PS Acid	<0.052	H cn	0.10	0.052	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.023	H cn	0.062	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorohexanoic acid (PFHxA)	<0.020	H cn	0.062	0.020	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorododecanoic acid (PFDoA)	<0.024	H cn	0.062	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	<0.032	H cn	0.062	0.032	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorooctanoic acid (PFOA)	**0.050**	**J H cn**	0.062	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorodecanoic acid (PFDA)	<0.025	H cn	0.062	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorodecanesulfonic acid (PFDS)	<0.022	H cn	0.062	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorohexanesulfonic acid (PFHxS)	**0.19**	**H cn**	0.062	0.020	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<0.021	H cn	0.062	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorobutanoic acid (PFBA)	<0.025	H cn	0.062	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorobutanesulfonic acid (PFBS)	<0.37	H cn	0.82	0.37	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoroheptanoic acid (PFHpA)	<0.025	H cn	0.062	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoroheptanesulfonic acid (PFHpS)	**0.062**	**H cn**	0.062	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorononanoic acid (PFNA)	<0.024	H cn	0.062	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorotetradecanoic acid (PFTeDA)	<0.025	H cn	0.062	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.024	H cn	0.062	0.024	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<0.018	H cn	0.062	0.018	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1

Client Sample ID: KA1-2, 1,6/58092-4
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-3
Matrix: Solid
Percent Solids: 96.3

Method: EPA 537 IDA - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	<0.016	H cn	0.062	0.016	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	<0.021	H cn	0.062	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	<0.020	H cn	0.062	0.020	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DA)	<0.025	H cn	0.062	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	<0.026	H cn	0.062	0.026	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoropropionic acid (PFPrA)	<0.21	H cn	0.52	0.21	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoropropanesulfonic acid (PFPrS)	<0.022	H cn	0.062	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
6:2 FTCA	<0.013	H cn	0.062	0.013	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
10:2 FTCA	<0.020	H cn	0.062	0.020	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro-2-methoxyacetic acid (PFMOAA)	<0.016	H cn	0.062	0.016	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.013	H cn	0.062	0.013	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorononanesulfonic acid (PFNS)	<0.023	H cn	0.062	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
EVE Acid	<0.052	H cn	0.10	0.052	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
8:2 FTUCA	<0.032	H cn	0.062	0.032	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
6:2 FTUCA	<0.028	H cn	0.062	0.028	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
10:2 FTUCA	<0.033	H cn	0.062	0.033	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorotridecanoic acid (PFTrDA)	<0.022	H cn	0.062	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Hydro-PS Acid	<0.025	H cn	0.062	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorooctanesulfonamide (PFOSAm)	<0.022	H cn	0.062	0.022	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<0.025	H cn	0.062	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<0.018	H cn	0.062	0.018	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<0.023	H cn	0.062	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Hydro-EVE Acid	<0.021	H cn	0.062	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluorododecanesulfonic acid (PFDoS)	<0.021	H cn	0.062	0.021	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	<0.025	H cn	0.062	0.025	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<0.016	H cn	0.062	0.016	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.023	H cn	0.062	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<0.020	H cn	0.062	0.020	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	<0.023	H cn	0.062	0.023	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1
MTP	<0.018	H cn	0.062	0.018	ng/g	☼	12/04/24 15:43	12/09/24 11:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d5-NEtFOSAA	*15*	*cn*	*10 - 188*	*12/04/24 15:43*	*12/09/24 11:55*	*1*
d3-NMeFOSAA	*8*	**5- cn*	*10 - 172*	*12/04/24 15:43*	*12/09/24 11:55*	*1*
13C3-HFPO-DA	*69*	*cn*	*17 - 147*	*12/04/24 15:43*	*12/09/24 11:55*	*1*
d7-N-MeFOSE-M	*94*	*cn*	*10 - 177*	*12/04/24 15:43*	*12/09/24 11:55*	*1*
d9-N-EtFOSE-M	*100*	*cn*	*10 - 168*	*12/04/24 15:43*	*12/09/24 11:55*	*1*

Client Sample ID: KA1-2, 1,6/58092-4

Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-3

Matrix: Solid
Percent Solids: 96.3

Method: EPA 537 IDA - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2-6:2 FTS	72	cn	10 - 200	12/04/24 15:43	12/09/24 11:55	1
13C2-8:2 FTS	82	cn	10 - 200	12/04/24 15:43	12/09/24 11:55	1
13C3-PFBS	104	cn	31 - 166	12/04/24 15:43	12/09/24 11:55	1
13C2-4:2 FTS	90	cn	10 - 190	12/04/24 15:43	12/09/24 11:55	1
13C5-PFHxA	64	cn	20 - 150	12/04/24 15:43	12/09/24 11:55	1
13C9-PFNA	74	cn	27 - 159	12/04/24 15:43	12/09/24 11:55	1
13C6-PFDA	76	cn	25 - 152	12/04/24 15:43	12/09/24 11:55	1
13C7-PFUnA	87	cn	12 - 169	12/04/24 15:43	12/09/24 11:55	1
13C3-PFHxS	101	cn	26 - 155	12/04/24 15:43	12/09/24 11:55	1
13C2-PFDoA	86	cn	10 - 164	12/04/24 15:43	12/09/24 11:55	1
d5-NEtPFOSA	36	cn	10 - 149	12/04/24 15:43	12/09/24 11:55	1
d3-NMePFOSA	33	cn	10 - 150	12/04/24 15:43	12/09/24 11:55	1
13C-6:2 FTCA	2	*5- cn	10 - 162	12/04/24 15:43	12/09/24 11:55	1
13C-8:2 FTCA	7	*5- cn	10 - 166	12/04/24 15:43	12/09/24 11:55	1
13C-10:2 FTCA	9	*5- cn	10 - 178	12/04/24 15:43	12/09/24 11:55	1
13C-6:2 FTUCA	1	*5- cn	10 - 168	12/04/24 15:43	12/09/24 11:55	1
13C-8:2 FTUCA	4	*5- cn	10 - 173	12/04/24 15:43	12/09/24 11:55	1
13C-10:2 FTUCA	7	*5- cn	10 - 181	12/04/24 15:43	12/09/24 11:55	1
13C4-PFBA	52	cn	25 - 147	12/04/24 15:43	12/09/24 11:55	1
13C5-PFPeA	57	cn	17 - 154	12/04/24 15:43	12/09/24 11:55	1
13C4-PFHpA	73	cn	20 - 158	12/04/24 15:43	12/09/24 11:55	1
13C8-PFOA	71	cn	28 - 148	12/04/24 15:43	12/09/24 11:55	1
13C8-PFOS	109	cn	34 - 153	12/04/24 15:43	12/09/24 11:55	1
13C8-PFOSA	86	cn	13 - 151	12/04/24 15:43	12/09/24 11:55	1
13C2-PFTeDA	88	cn	10 - 165	12/04/24 15:43	12/09/24 11:55	1
13C3-PFPrA	34	cn	10 - 158	12/04/24 15:43	12/09/24 11:55	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (EPA Moisture)	3.7		1.0	1.0	%			11/15/24 09:08	1

Client Sample ID: PVA1-20, 75/60821-1

Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-4

Matrix: Water

Method: EPA 537 (mod) - EPA 537 Isotope DIlution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NVHOS	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
PES	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
DNU Perfluoro-3-methoxypropanoic acid (PMPA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
PFECHS	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoro-n-octadecanoic acid (PFODA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1

Client Sample ID: PVA1-20, 75/60821-1
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-4
Matrix: Water

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**1400**		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoroundecanoic acid (PFUnA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
R-PSDA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Hydrolyzed PSDA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
R-PSDCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
R-EVE	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
PEPA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoropentanoic acid (PFPeA)	**21000**		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoropentanesulfonic acid (PFPeS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	**31000**		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
8:2 FTCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
PS Acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorohexanoic acid (PFHxA)	**6500**		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorododecanoic acid (PFDoA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorooctanoic acid (PFOA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorodecanoic acid (PFDA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorodecanesulfonic acid (PFDS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorohexanesulfonic acid (PFHxS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorobutanoic acid (PFBA)	**2800**		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorobutanesulfonic acid (PFBS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoroheptanoic acid (PFHpA)	**2000**		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoroheptanesulfonic acid (PFHpS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorononanoic acid (PFNA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorotetradecanoic acid (PFTeDA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoropropionic acid (PFPrA)	**1100**		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1

Client: Eurofins VBM Laboratoriet A/S
Project/Site: AAUe udvaskningsprojekt

Job ID: 410-196590-1

Client Sample ID: PVA1-20, 75/60821-1
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-4
Matrix: Water

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoropropanesulfonic acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
6:2 FTCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
10:2 FTCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoro-2-methoxyacetic acid (PFMOAA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorononanesulfonic acid (PFNS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
EVE Acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
8:2 FTUCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
6:2 FTUCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
10:2 FTUCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorotridecanoic acid (PFTrDA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Hydro-PS Acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorooctanesulfonamide (PFOSAm)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Hydro-EVE Acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluorododecanesulfonic acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1
MTP	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d5-NEtFOSAA	*129*		*34 - 178*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
d3-NMeFOSAA	*105*		*38 - 162*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
13C3 HFPO-DA	*100*		*41 - 163*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
d7-N-MeFOSE-M	*105*		*36 - 165*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
d9-N-EtFOSE-M	*97*		*44 - 158*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
M2-6:2 FTS	*90*		*45 - 167*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
M2-8:2 FTS	*99*		*58 - 158*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
13C3 PFBS	*91*		*63 - 160*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
M2-4:2 FTS	*95*		*46 - 166*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
13C5 PFHxA	*95*		*50 - 156*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
13C9 PFNA	*101*		*60 - 142*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
13C6 PFDA	*97*		*64 - 141*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
13C7 PFUnA	*106*		*27 - 168*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
13C3 PFHxS	*88*		*57 - 159*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
13C2-PFDoDA	*100*		*29 - 158*	*11/15/24 14:04*	*11/18/24 18:35*	*1*
d5-NEtPFOSA	*99*		*41 - 153*	*11/15/24 14:04*	*11/18/24 18:35*	*1*

Client Sample ID: PVA1-20, 75/60821-1

Lab Sample ID: 410-196590-4

Date Collected: 10/21/24 00:00

Matrix: Water

Date Received: 11/14/24 12:00

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d3-NMePFOSA	97		36 - 151	11/15/24 14:04	11/18/24 18:35	1
13C-6:2 FTCA	80		10 - 200	11/15/24 14:04	11/18/24 18:35	1
13C-8:2 FTCA	79		10 - 200	11/15/24 14:04	11/18/24 18:35	1
13C-10:2 FTCA	84		10 - 200	11/15/24 14:04	11/18/24 18:35	1
13C-6:2 FTUCA	114		10 - 169	11/15/24 14:04	11/18/24 18:35	1
13C-8:2 FTUCA	117		10 - 164	11/15/24 14:04	11/18/24 18:35	1
13C-10:2 FTUCA	121		10 - 192	11/15/24 14:04	11/18/24 18:35	1
13C4 PFBA	98		67 - 136	11/15/24 14:04	11/18/24 18:35	1
13C5 PFPeA	95		63 - 139	11/15/24 14:04	11/18/24 18:35	1
13C4 PFHpA	104		60 - 150	11/15/24 14:04	11/18/24 18:35	1
13C8 PFOA	96		62 - 146	11/15/24 14:04	11/18/24 18:35	1
13C8 PFOS	102		64 - 141	11/15/24 14:04	11/18/24 18:35	1
13C8 FOSA	94		46 - 150	11/15/24 14:04	11/18/24 18:35	1
13C2 PFTeDA	96		33 - 150	11/15/24 14:04	11/18/24 18:35	1
13C3-PFPrA	95		50 - 150	11/15/24 14:04	11/18/24 18:35	1

Client Sample ID: PVB1-1, 1/60821-2

Lab Sample ID: 410-196590-5

Date Collected: 10/21/24 00:00

Matrix: Water

Date Received: 11/14/24 12:00

Method: EPA 537 (mod) - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NVHOS	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
PES	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
DNU Perfluoro-3-methoxypropanoic acid (PMPA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
PFECHS	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoro-n-octadecanoic acid (PFODA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorooctanesulfonic acid (PFOS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoroundecanoic acid (PFUnA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
R-PSDA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Hydrolyzed PSDA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
R-PSDCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
R-EVE	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
PEPA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoropentanoic acid (PFPeA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoropentanesulfonic acid (PFPeS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1

Client Sample ID: PVB1-1, 1/60821-2
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-5
Matrix: Water

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
8:2 FTCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
PS Acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorohexanoic acid (PFHxA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorododecanoic acid (PFDoA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorooctanoic acid (PFOA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorodecanoic acid (PFDA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorodecanesulfonic acid (PFDS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorohexanesulfonic acid (PFHxS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorobutanoic acid (PFBA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorobutanesulfonic acid (PFBS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoroheptanoic acid (PFHpA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoroheptanesulfonic acid (PFHpS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorononanoic acid (PFNA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorotetradecanoic acid (PFTeDA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoropropionic acid (PFPrA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoropropanesulfonic acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
6:2 FTCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
10:2 FTCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoro-2-methoxyacetic acid (PFMOAA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorononanesulfonic acid (PFNS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
EVE Acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
8:2 FTUCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
6:2 FTUCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
10:2 FTUCA	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorotridecanoic acid (PFTrDA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Hydro-PS Acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1

Client: Eurofins VBM Laboratoriet A/S
Project/Site: AAUe udvaskningsprojekt

Job ID: 410-196590-1

Client Sample ID: PVB1-1, 1/60821-2
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-5
Matrix: Water

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonamide (PFOSAm)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Hydro-EVE Acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluorododecanesulfonic acid	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1
MTP	<1000		1000	1000	ng/L		11/15/24 14:04	11/18/24 18:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d5-NEtFOSAA	*110*		*34 - 178*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
d3-NMeFOSAA	*95*		*38 - 162*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C3 HFPO-DA	*84*		*41 - 163*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
d7-N-MeFOSE-M	*95*		*36 - 165*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
d9-N-EtFOSE-M	*87*		*44 - 158*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
M2-6:2 FTS	*86*		*45 - 167*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
M2-8:2 FTS	*84*		*58 - 158*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C3 PFBS	*85*		*63 - 160*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
M2-4:2 FTS	*91*		*46 - 166*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C5 PFHxA	*85*		*50 - 156*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C9 PFNA	*93*		*60 - 142*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C6 PFDA	*84*		*64 - 141*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C7 PFUnA	*93*		*27 - 168*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C3 PFHxS	*83*		*57 - 159*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C2-PFDoDA	*87*		*29 - 158*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
d5-NEtPFOSA	*89*		*41 - 153*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
d3-NMePFOSA	*86*		*36 - 151*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C-6:2 FTCA	*72*		*10 - 200*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C-8:2 FTCA	*72*		*10 - 200*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C-10:2 FTCA	*75*		*10 - 200*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C-6:2 FTUCA	*109*		*10 - 169*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C-8:2 FTUCA	*101*		*10 - 164*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C-10:2 FTUCA	*103*		*10 - 192*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C4 PFBA	*90*		*67 - 136*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C5 PFPeA	*83*		*63 - 139*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C4 PFHpA	*94*		*60 - 150*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C8 PFOA	*89*		*62 - 146*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C8 PFOS	*97*		*64 - 141*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C8 FOSA	*82*		*46 - 150*	*11/15/24 14:04*	*11/18/24 18:48*	*1*

Client Sample ID: PVB1-1, 1/60821-2

Lab Sample ID: 410-196590-5

Date Collected: 10/21/24 00:00
Matrix: Water
Date Received: 11/14/24 12:00

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFTeDA	*82*		*33 - 150*	*11/15/24 14:04*	*11/18/24 18:48*	*1*
13C3-PFPrA	*86*		*50 - 150*	*11/15/24 14:04*	*11/18/24 18:48*	*1*

Client Sample ID: PVC2-1, 1,5/60821-3

Lab Sample ID: 410-196590-6

Date Collected: 10/21/24 00:00
Matrix: Water
Date Received: 11/14/24 12:00

Method: EPA 537 (mod) - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NVHOS	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
PES	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
DNU Perfluoro-3-methoxypropanoic acid (PMPA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
PFECHS	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoro-n-octadecanoic acid (PFODA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorooctanesulfonic acid (PFOS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoroundecanoic acid (PFUnA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
R-PSDA	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Hydrolyzed PSDA	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
R-PSDCA	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
R-EVE	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
PEPA	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoropentanoic acid (PFPeA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoropentanesulfonic acid (PFPeS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
8:2 FTCA	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
PS Acid	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorohexanoic acid (PFHxA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorododecanoic acid (PFDoA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorooctanoic acid (PFOA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorodecanoic acid (PFDA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorodecanesulfonic acid (PFDS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorohexanesulfonic acid (PFHxS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1

Client: Eurofins VBM Laboratoriet A/S
Project/Site: AAUe udvaskningsprojekt

Job ID: 410-196590-1

Client Sample ID: PVC2-1, 1,5/60821-3
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-6
Matrix: Water

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorobutanoic acid (PFBA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorobutanesulfonic acid (PFBS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoroheptanoic acid (PFHpA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoroheptanesulfonic acid (PFHpS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorononanoic acid (PFNA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorotetradecanoic acid (PFTeDA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoropropionic acid (PFPrA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoropropanesulfonic acid	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
6:2 FTCA	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
10:2 FTCA	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoro-2-methoxyacetic acid (PFMOAA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorononanesulfonic acid (PFNS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
EVE Acid	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
8:2 FTUCA	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
6:2 FTUCA	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
10:2 FTUCA	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorotridecanoic acid (PFTrDA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Hydro-PS Acid	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorooctanesulfonamide (PFOSAm)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Hydro-EVE Acid	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluorododecanesulfonic acid	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1

Client Sample ID: PVC2-1, 1,5/60821-3
Date Collected: 10/21/24 00:00
Date Received: 11/14/24 12:00

Lab Sample ID: 410-196590-6
Matrix: Water

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1
MTP	<1000		1000	1000	ng/L		11/15/24 14:05	11/18/24 19:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d5-NEtFOSAA	*124*		*34 - 178*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
d3-NMeFOSAA	*99*		*38 - 162*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C3 HFPO-DA	*97*		*41 - 163*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
d7-N-MeFOSE-M	*98*		*36 - 165*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
d9-N-EtFOSE-M	*92*		*44 - 158*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
M2-6:2 FTS	*90*		*45 - 167*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
M2-8:2 FTS	*91*		*58 - 158*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C3 PFBS	*87*		*63 - 160*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
M2-4:2 FTS	*92*		*46 - 166*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C5 PFHxA	*88*		*50 - 156*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C9 PFNA	*97*		*60 - 142*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C6 PFDA	*95*		*64 - 141*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C7 PFUnA	*102*		*27 - 168*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C3 PFHxS	*85*		*57 - 159*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C2-PFDoDA	*95*		*29 - 158*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
d5-NEtPFOSA	*99*		*41 - 153*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
d3-NMePFOSA	*91*		*36 - 151*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C-6:2 FTCA	*78*		*10 - 200*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C-8:2 FTCA	*81*		*10 - 200*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C-10:2 FTCA	*82*		*10 - 200*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C-6:2 FTUCA	*113*		*10 - 169*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C-8:2 FTUCA	*113*		*10 - 164*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C-10:2 FTUCA	*113*		*10 - 192*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C4 PFBA	*91*		*67 - 136*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C5 PFPeA	*89*		*63 - 139*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C4 PFHpA	*92*		*60 - 150*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C8 PFOA	*89*		*62 - 146*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C8 PFOS	*98*		*64 - 141*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C8 FOSA	*87*		*46 - 150*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C2 PFTeDA	*87*		*33 - 150*	*11/15/24 14:05*	*11/18/24 19:02*	*1*
13C3-PFPrA	*90*		*50 - 150*	*11/15/24 14:05*	*11/18/24 19:02*	*1*

Isotope Dilution Summary

Client: Eurofins VBM Laboratoriet A/S
Project/Site: AAUe udvaskningsprojekt

Job ID: 410-196590-1

Method: 537 IDA - EPA 537 Isotope Dilution

Matrix: Solid | **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		d5NEFOS	d3NMFOS	HFPODA	NMFM	NEFM	M262FTS	M282FTS	C3PFBS
Lab Sample ID	Client Sample ID	(10-188)	(10-172)	(17-147)	(10-177)	(10-168)	(10-200)	(10-200)	(31-166)
410-196590-1	KA1-2, 1/58092-1	84 cn	66 cn	71 cn	38 cn	42 cn	87 cn	96 cn	83 cn
410-196590-2	KA1-2 1,6/58092-3	66 cn	42 cn	89 cn	114 cn	105 cn	87 cn	99 cn	108 cn
410-196590-3	KA1-2, 1,6/58092-4	15 cn	8 *5- cn	69 cn	94 cn	100 cn	72 cn	82 cn	104 cn
LCS 410-582115/2-B	Lab Control Sample	79	69	75	86	90	86	85	89
LCS 410-584381/2-B	Lab Control Sample	70	66	81	83	81	83	83	91
LCSD 410-582115/3-B	Lab Control Sample Dup	74	68	84	90	95	87	83	96
LCSD 410-584381/3-B	Lab Control Sample Dup	77	67	84	82	80	83	74	87
MB 410-582115/1-B	Method Blank	79	66	79	81	81	80	94	93
MB 410-584381/1-B	Method Blank	68	57	86	90	80	87	81	88

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		M242FTS	13C5PHA	C9PFNA	C6PFDA	13C7PUA	C3PFHS	PFDoDA	d5NPFSA
Lab Sample ID	Client Sample ID	(10-190)	(20-150)	(27-159)	(25-152)	(12-169)	(26-155)	(10-164)	(10-149)
410-196590-1	KA1-2, 1/58092-1	91 cn	82 cn	86 cn	84 cn	93 cn	81 cn	97 cn	17 cn
410-196590-2	KA1-2 1,6/58092-3	97 cn	99 cn	102 cn	103 cn	115 cn	99 cn	110 cn	86 cn
410-196590-3	KA1-2, 1,6/58092-4	90 cn	64 cn	74 cn	76 cn	87 cn	101 cn	86 cn	36 cn
LCS 410-582115/2-B	Lab Control Sample	100	91	88	89	98	87	94	51
LCS 410-584381/2-B	Lab Control Sample	78	78	86	83	84	84	73	64
LCSD 410-582115/3-B	Lab Control Sample Dup	107	98	96	98	102	93	100	51
LCSD 410-584381/3-B	Lab Control Sample Dup	85	80	86	82	83	84	70	51
MB 410-582115/1-B	Method Blank	100	87	90	94	104	87	98	40
MB 410-584381/1-B	Method Blank	84	81	85	86	87	87	79	62

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		d3NMFSA	MFHEA	MFOEA	MFDEA	MFHUEA	MFOUEA	MFDUEA	PFBA
Lab Sample ID	Client Sample ID	(10-150)	(10-162)	(10-166)	(10-178)	(10-168)	(10-173)	(10-181)	(25-147)
410-196590-1	KA1-2, 1/58092-1	14 cn	50 cn	52 cn	57 cn	74 cn	71 cn	78 cn	76 cn
410-196590-2	KA1-2 1,6/58092-3	87 cn	34 cn	36 cn	38 cn	86 cn	94 cn	92 cn	100 cn
410-196590-3	KA1-2, 1,6/58092-4	33 cn	2 *5- cn	7 *5- cn	9 *5- cn	1 *5- cn	4 *5- cn	7 *5- cn	52 cn
LCS 410-582115/2-B	Lab Control Sample	52	65	65	65	96	102	98	84
LCS 410-584381/2-B	Lab Control Sample	72	57	58	55	80	83	81	83
LCSD 410-582115/3-B	Lab Control Sample Dup	50	59	66	63	102	105	105	89
LCSD 410-584381/3-B	Lab Control Sample Dup	59	59	60	61	73	76	78	80
MB 410-582115/1-B	Method Blank	45	55	63	64	91	99	103	88
MB 410-584381/1-B	Method Blank	73	51	48	57	78	74	77	82

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFPeA	C4PFHA	C8PFOA	C8PFOS	PFOSA	PFTDA	3C3PFPrA	
Lab Sample ID	Client Sample ID	(17-154)	(20-158)	(28-148)	(34-153)	(13-151)	(10-165)	(10-158)	
410-196590-1	KA1-2, 1/58092-1	78 cn	86 cn	81 cn	86 cn	46 cn	86 cn	74 cn	
410-196590-2	KA1-2 1,6/58092-3	100 cn	103 cn	99 cn	108 cn	99 cn	97 cn	76 cn	
410-196590-3	KA1-2, 1,6/58092-4	57 cn	73 cn	71 cn	109 cn	86 cn	88 cn	34 cn	
LCS 410-582115/2-B	Lab Control Sample	87	96	90	92	75	96	72	
LCS 410-584381/2-B	Lab Control Sample	83	85	82	90	85	72	53	
LCSD 410-582115/3-B	Lab Control Sample Dup	93	99	95	100	87	102	77	
LCSD 410-584381/3-B	Lab Control Sample Dup	79	87	84	89	77	74	61	
MB 410-582115/1-B	Method Blank	87	94	87	96	79	91	78	
MB 410-584381/1-B	Method Blank	84	87	87	90	49	75	66	

Surrogate Legend

d5NEFOS = d5-NEtFOSAA

d3NMFOS = d3-NMeFOSAA

Isotope Dilution Summary

Client: Eurofins VBM Laboratoriet A/S
Job ID: 410-196590-1
Project/Site: AAUe udvaskningsprojekt

HFPODA = 13C3-HFPO-DA
NMFM = d7-N-MeFOSE-M
NEFM = d9-N-EtFOSE-M
M262FTS = 13C2-6:2 FTS
M282FTS = 13C2-8:2 FTS
C3PFBS = 13C3-PFBS
M242FTS = 13C2-4:2 FTS
13C5PHA = 13C5-PFHxA
C9PFNA = 13C9-PFNA
C6PFDA = 13C6-PFDA
13C7PUA = 13C7-PFUnA
C3PFHS = 13C3-PFHxS
PFDoDA = 13C2-PFDoA
d5NPFSA = d5-NEtPFOSA
d3NMFSA = d3-NMePFOSA
MFHEA = 13C-6:2 FTCA
MFOEA = 13C-8:2 FTCA
MFDEA = 13C-10:2 FTCA
MFHUEA = 13C-6:2 FTUCA
MFOUEA = 13C-8:2 FTUCA
MFDUEA = 13C-10:2 FTUCA
PFBA = 13C4-PFBA
PFPeA = 13C5-PFPeA
C4PFHA = 13C4-PFHpA
C8PFOA = 13C8-PFOA
C8PFOS = 13C8-PFOS
PFOSA = 13C8-PFOSA
PFTDA = 13C2-PFTeDA
13C3PFPrA = 13C3-PFPrA

Method: EPA 537 (mod) - EPA 537 Isotope Dilution

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		d5NEFOS	d3NMFOS	HFPODA	NMFM	NEFM	M262FTS	M282FTS	C3PFBS
Lab Sample ID	Client Sample ID	(34-178)	(38-162)	(41-163)	(36-165)	(44-158)	(45-167)	(58-158)	(63-160)
410-196590-4	PVA1-20, 75/60821-1	129	105	100	105	97	90	99	91
410-196590-5	PVB1-1, 1/60821-2	110	95	84	95	87	86	84	85
410-196590-6	PVC2-1, 1,5/60821-3	124	99	97	98	92	90	91	87
LCS 410-575681/2-A	Lab Control Sample	99	92	84	81	83	80	78	80
LCSD 410-575681/3-A	Lab Control Sample Dup	104	104	98	95	94	87	84	84
MB 410-575681/1-A	Method Blank	94	76	75	76	72	70	74	69

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		M242FTS	13C5PHA	C9PFNA	C6PFDA	13C7PUA	C3PFHS	PFDoDA	d5NPFSA
Lab Sample ID	Client Sample ID	(46-166)	(50-156)	(60-142)	(64-141)	(27-168)	(57-159)	(29-158)	(41-153)
410-196590-4	PVA1-20, 75/60821-1	95	95	101	97	106	88	100	99
410-196590-5	PVB1-1, 1/60821-2	91	85	93	84	93	83	87	89
410-196590-6	PVC2-1, 1,5/60821-3	92	88	97	95	102	85	95	99
LCS 410-575681/2-A	Lab Control Sample	78	79	84	79	84	75	81	83
LCSD 410-575681/3-A	Lab Control Sample Dup	93	90	94	84	95	86	88	94
MB 410-575681/1-A	Method Blank	70	74	76	73	76	68	72	72

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		d3NMFSA	MFHEA	MFOEA	MFDEA	MFHUEA	MFOUEA	MFDUEA	PFBA
Lab Sample ID	Client Sample ID	(36-151)	(10-200)	(10-200)	(10-200)	(10-169)	(10-164)	(10-192)	(67-136)
410-196590-4	PVA1-20, 75/60821-1	97	80	79	84	114	117	121	98
410-196590-5	PVB1-1, 1/60821-2	86	72	72	75	109	101	103	90

Isotope Dilution Summary

Client: Eurofins VBM Laboratoriet A/S
Job ID: 410-196590-1
Project/Site: AAUe udvaskningsprojekt

Method: EPA 537 (mod) - EPA 537 Isotope DIlution (Continued)

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	d3NMFSA (36-151)	MFHEA (10-200)	MFOEA (10-200)	MFDEA (10-200)	MFHUEA (10-169)	MFOUEA (10-164)	MFDUEA (10-192)	PFBA (67-136)
410-196590-6	PVC2-1, 1,5/60821-3	91	78	81	82	113	113	113	91
LCS 410-575681/2-A	Lab Control Sample	77	62	65	72	101	97	107	79
LCSD 410-575681/3-A	Lab Control Sample Dup	87	74	74	79	113	120	116	94
MB 410-575681/1-A	Method Blank	72	64	60	61	94	89	90	75

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFPeA (63-139)	C4PFHA (60-150)	C8PFOA (62-146)	C8PFOS (64-141)	PFOSA (46-150)	PFTDA (33-150)	3C3PFPrA (50-150)	
410-196590-4	PVA1-20, 75/60821-1	95	104	96	102	94	96	95	
410-196590-5	PVB1-1, 1/60821-2	83	94	89	97	82	82	86	
410-196590-6	PVC2-1, 1,5/60821-3	89	92	89	98	87	87	90	
LCS 410-575681/2-A	Lab Control Sample	75	82	78	84	76	77	77	
LCSD 410-575681/3-A	Lab Control Sample Dup	84	95	88	95	88	93	88	
MB 410-575681/1-A	Method Blank	70	76	74	77	71	67	70	

Surrogate Legend

d5NEFOS = d5-NEtFOSAA
d3NMFOS = d3-NMeFOSAA
HFPODA = 13C3 HFPO-DA
NMFM = d7-N-MeFOSE-M
NEFM = d9-N-EtFOSE-M
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS
C3PFBS = 13C3 PFBS
M242FTS = M2-4:2 FTS
13C5PHA = 13C5 PFHxA
C9PFNA = 13C9 PFNA
C6PFDA = 13C6 PFDA
13C7PUA = 13C7 PFUnA
C3PFHS = 13C3 PFHxS
PFDoDA = 13C2-PFDoDA
d5NPFSA = d5-NEtPFOSA
d3NMFSA = d3-NMePFOSA
MFHEA = 13C-6:2 FTCA
MFOEA = 13C-8:2 FTCA
MFDEA = 13C-10:2 FTCA
MFHUEA = 13C-6:2 FTUCA
MFOUEA = 13C-8:2 FTUCA
MFDUEA = 13C-10:2 FTUCA
PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
C4PFHA = 13C4 PFHpA
C8PFOA = 13C8 PFOA
C8PFOS = 13C8 PFOS
PFOSA = 13C8 FOSA
PFTDA = 13C2 PFTeDA
13C3PFPrA = 13C3-PFPrA

Method: 537 IDA - EPA 537 Isotope Dilution

Lab Sample ID: MB 410-582115/1-B
Matrix: Solid
Analysis Batch: 583606

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 582115

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NVHOS	<0.021		0.060	0.021	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<0.020		0.060	0.020	ng/g		12/04/24 15:43	12/09/24 10:47	1
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	<0.022		0.060	0.022	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro-2-(perfluoromethoxy)propanoic acid (PMPA)	<0.018		0.060	0.018	ng/g		12/04/24 15:43	12/09/24 10:47	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<0.20		1.0	0.20	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	<0.019		0.060	0.019	ng/g		12/04/24 15:43	12/09/24 10:47	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.024		0.060	0.024	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.012		0.060	0.012	ng/g		12/04/24 15:43	12/09/24 10:47	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	<0.020		0.060	0.020	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorooctanesulfonic acid (PFOS)	0.0383	J	0.060	0.035	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoroundecanoic acid (PFUnA)	<0.056		0.10	0.056	ng/g		12/04/24 15:43	12/09/24 10:47	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.031		0.060	0.031	ng/g		12/04/24 15:43	12/09/24 10:47	1
R-PSDA	<0.030		0.060	0.030	ng/g		12/04/24 15:43	12/09/24 10:47	1
Hydrolyzed PSDA	<0.020		0.060	0.020	ng/g		12/04/24 15:43	12/09/24 10:47	1
R-PSDCA	<0.022		0.060	0.022	ng/g		12/04/24 15:43	12/09/24 10:47	1
R-EVE	<0.020		0.060	0.020	ng/g		12/04/24 15:43	12/09/24 10:47	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	<0.023		0.060	0.023	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro-2-(perfluoroethoxy)propionic acid (PEPA)	<0.020		0.060	0.020	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoropentanoic acid (PFPeA)	<0.024		0.060	0.024	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoropentanesulfonic acid (PFPeS)	<0.022		0.060	0.022	ng/g		12/04/24 15:43	12/09/24 10:47	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<0.049		0.10	0.049	ng/g		12/04/24 15:43	12/09/24 10:47	1
8:2 FTCA	<0.016		0.060	0.016	ng/g		12/04/24 15:43	12/09/24 10:47	1
PS Acid	<0.050		0.10	0.050	ng/g		12/04/24 15:43	12/09/24 10:47	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.022		0.060	0.022	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorohexanoic acid (PFHxA)	<0.019		0.060	0.019	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorododecanoic acid (PFDoA)	<0.023		0.060	0.023	ng/g		12/04/24 15:43	12/09/24 10:47	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	<0.031		0.060	0.031	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorooctanoic acid (PFOA)	<0.022		0.060	0.022	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorodecanoic acid (PFDA)	<0.024		0.060	0.024	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorodecanesulfonic acid (PFDS)	<0.021		0.060	0.021	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorohexanesulfonic acid (PFHxS)	<0.019		0.060	0.019	ng/g		12/04/24 15:43	12/09/24 10:47	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<0.020		0.060	0.020	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorobutanoic acid (PFBA)	<0.024		0.060	0.024	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorobutanesulfonic acid (PFBS)	<0.36		0.80	0.36	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoroheptanoic acid (PFHpA)	<0.024		0.060	0.024	ng/g		12/04/24 15:43	12/09/24 10:47	1

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: MB 410-582115/1-B
Matrix: Solid
Analysis Batch: 583606

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 582115

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanesulfonic acid (PFHpS)	<0.020		0.060	0.020	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorononanoic acid (PFNA)	<0.023		0.060	0.023	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorotetradecanoic acid (PFTeDA)	<0.024		0.060	0.024	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.023		0.060	0.023	ng/g		12/04/24 15:43	12/09/24 10:47	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<0.017		0.060	0.017	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	<0.016		0.060	0.016	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	<0.020		0.060	0.020	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	<0.019		0.060	0.019	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DA)	<0.024		0.060	0.024	ng/g		12/04/24 15:43	12/09/24 10:47	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	<0.025		0.060	0.025	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoropropionic acid (PFPrA)	<0.20		0.50	0.20	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoropropanesulfonic acid (PFPrS)	<0.021		0.060	0.021	ng/g		12/04/24 15:43	12/09/24 10:47	1
6:2 FTCA	<0.013		0.060	0.013	ng/g		12/04/24 15:43	12/09/24 10:47	1
10:2 FTCA	<0.019		0.060	0.019	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro-2-methoxyacetic acid (PFMOAA)	<0.016		0.060	0.016	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.013		0.060	0.013	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorononanesulfonic acid (PFNS)	<0.022		0.060	0.022	ng/g		12/04/24 15:43	12/09/24 10:47	1
EVE Acid	<0.050		0.10	0.050	ng/g		12/04/24 15:43	12/09/24 10:47	1
8:2 FTUCA	<0.031		0.060	0.031	ng/g		12/04/24 15:43	12/09/24 10:47	1
6:2 FTUCA	<0.027		0.060	0.027	ng/g		12/04/24 15:43	12/09/24 10:47	1
10:2 FTUCA	<0.032		0.060	0.032	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorotridecanoic acid (PFTrDA)	<0.021		0.060	0.021	ng/g		12/04/24 15:43	12/09/24 10:47	1
Hydro-PS Acid	<0.024		0.060	0.024	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorooctanesulfonamide (PFOSAm)	<0.021		0.060	0.021	ng/g		12/04/24 15:43	12/09/24 10:47	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<0.024		0.060	0.024	ng/g		12/04/24 15:43	12/09/24 10:47	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<0.017		0.060	0.017	ng/g		12/04/24 15:43	12/09/24 10:47	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<0.022		0.060	0.022	ng/g		12/04/24 15:43	12/09/24 10:47	1
Hydro-EVE Acid	<0.020		0.060	0.020	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluorododecanesulfonic acid (PFDoS)	<0.020		0.060	0.020	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	<0.024		0.060	0.024	ng/g		12/04/24 15:43	12/09/24 10:47	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<0.016		0.060	0.016	ng/g		12/04/24 15:43	12/09/24 10:47	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.022		0.060	0.022	ng/g		12/04/24 15:43	12/09/24 10:47	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<0.019		0.060	0.019	ng/g		12/04/24 15:43	12/09/24 10:47	1

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: MB 410-582115/1-B
Matrix: Solid
Analysis Batch: 583606

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 582115

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	<0.022		0.060	0.022	ng/g		12/04/24 15:43	12/09/24 10:47	1
MTP	<0.017		0.060	0.017	ng/g		12/04/24 15:43	12/09/24 10:47	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d5-NEtFOSAA	*79*		*10 - 188*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
d3-NMeFOSAA	*66*		*10 - 172*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C3-HFPO-DA	*79*		*17 - 147*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
d7-N-MeFOSE-M	*81*		*10 - 177*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
d9-N-EtFOSE-M	*81*		*10 - 168*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C2-6:2 FTS	*80*		*10 - 200*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C2-8:2 FTS	*94*		*10 - 200*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C3-PFBS	*93*		*31 - 166*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C2-4:2 FTS	*100*		*10 - 190*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C5-PFHxA	*87*		*20 - 150*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C9-PFNA	*90*		*27 - 159*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C6-PFDA	*94*		*25 - 152*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C7-PFUnA	*104*		*12 - 169*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C3-PFHxS	*87*		*26 - 155*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C2-PFDoA	*98*		*10 - 164*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
d5-NEtPFOSA	*40*		*10 - 149*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
d3-NMePFOSA	*45*		*10 - 150*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C-6:2 FTCA	*55*		*10 - 162*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C-8:2 FTCA	*63*		*10 - 166*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C-10:2 FTCA	*64*		*10 - 178*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C-6:2 FTUCA	*91*		*10 - 168*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C-8:2 FTUCA	*99*		*10 - 173*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C-10:2 FTUCA	*103*		*10 - 181*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C4-PFBA	*88*		*25 - 147*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C5-PFPeA	*87*		*17 - 154*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C4-PFHpA	*94*		*20 - 158*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C8-PFOA	*87*		*28 - 148*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C8-PFOS	*96*		*34 - 153*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C8-PFOSA	*79*		*13 - 151*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C2-PFTeDA	*91*		*10 - 165*	*12/04/24 15:43*	*12/09/24 10:47*	*1*
13C3-PFPrA	*78*		*10 - 158*	*12/04/24 15:43*	*12/09/24 10:47*	*1*

Lab Sample ID: LCS 410-582115/2-B
Matrix: Solid
Analysis Batch: 583606

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 582115

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
NVHOS	2.50	2.29		ng/g		92	49 - 130
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	2.23	2.21		ng/g		99	56 - 130
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	2.42	2.59		ng/g		107	43 - 139
Perfluoro-2-(perfluoromethoxy)propanoic acid (PMPA)	2.50	2.04		ng/g		81	49 - 130

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-582115/2-B
Matrix: Solid
Analysis Batch: 583606

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 582115

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.50	2.67		ng/g		107	45 - 130
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	2.31	2.23		ng/g		97	59 - 130
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	2.50	2.34		ng/g		93	44 - 130
Perfluoro-n-octadecanoic acid (PFODA)	2.50	2.28		ng/g		91	30 - 137
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	2.50	2.41		ng/g		96	60 - 130
Perfluorooctanesulfonic acid (PFOS)	2.32	2.11		ng/g		91	57 - 130
Perfluoroundecanoic acid (PFUnA)	2.50	2.33		ng/g		93	59 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.50	2.32		ng/g		93	60 - 130
R-PSDA	2.50	1.70		ng/g		68	10 - 142
Hydrolyzed PSDA	2.50	1.35		ng/g		54	10 - 152
R-PSDCA	2.50	1.90		ng/g		76	59 - 130
R-EVE	2.50	1.48		ng/g		59	10 - 151
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	2.50	2.39		ng/g		96	59 - 130
Perfluoro-2-(perfluoroethoxy)propionic acid (PEPA)	2.50	1.94		ng/g		78	36 - 130
Perfluoropentanoic acid (PFPeA)	2.50	2.22		ng/g		89	58 - 130
Perfluoropentanesulfonic acid (PFPeS)	2.35	2.29		ng/g		97	62 - 130
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	2.38	2.14		ng/g		90	58 - 130
8:2 FTCA	2.50	2.32		ng/g		93	45 - 130
PS Acid	2.50	0.377		ng/g		15	10 - 155
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.50	2.40		ng/g		96	58 - 130
Perfluorohexanoic acid (PFHxA)	2.50	2.34		ng/g		94	56 - 130
Perfluorododecanoic acid (PFDoA)	2.50	2.54		ng/g		102	59 - 130
N-methylperfluorooctane sulfonamide (NMeFOSA)	2.50	2.36		ng/g		94	47 - 151
Perfluorooctanoic acid (PFOA)	2.50	2.28		ng/g		91	56 - 130
Perfluorodecanoic acid (PFDA)	2.50	2.42		ng/g		97	59 - 130
Perfluorodecanesulfonic acid (PFDS)	2.41	2.07		ng/g		86	57 - 130
Perfluorohexanesulfonic acid (PFHxS)	2.28	2.20		ng/g		96	60 - 130
3-Perfluoropropylpropanoic acid (3:3 FTCA)	2.50	1.30		ng/g		52	10 - 130
Perfluorobutanoic acid (PFBA)	2.50	2.33		ng/g		93	56 - 130
Perfluorobutanesulfonic acid (PFBS)	2.21	2.11		ng/g		95	61 - 130
Perfluoroheptanoic acid (PFHpA)	2.50	2.31		ng/g		92	61 - 130
Perfluoroheptanesulfonic acid (PFHpS)	2.39	2.26		ng/g		95	61 - 130
Perfluorononanoic acid (PFNA)	2.50	2.36		ng/g		94	62 - 130

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-582115/2-B
Matrix: Solid
Analysis Batch: 583606

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 582115

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorotetradecanoic acid (PFTeDA)	2.50	2.57		ng/g		103	58 - 130
Perfluoro-3-methoxypropanoic acid (PFMPA)	2.50	2.59		ng/g		104	45 - 136
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	2.40	2.45		ng/g		102	55 - 130
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	2.50	2.07		ng/g		83	47 - 130
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	2.50	2.16		ng/g		86	49 - 131
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	2.50	2.06		ng/g		82	43 - 135
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DA)	2.50	2.01		ng/g		80	47 - 132
N-ethylperfluorooctane sulfonamide (NEtFOSA)	2.50	2.31		ng/g		92	63 - 130
Perfluoropropionic acid (PFPrA)	2.50	2.28		ng/g		91	34 - 143
Perfluoropropanesulfonic acid (PFPrS)	2.30	2.70		ng/g		117	52 - 142
6:2 FTCA	2.50	2.13		ng/g		85	43 - 130
10:2 FTCA	2.50	2.31		ng/g		92	42 - 130
Perfluoro-2-methoxyacetic acid (PFMOAA)	2.50	1.98		ng/g		79	31 - 139
Perfluoro-n-hexadecanoic acid (PFHxDA)	2.50	2.42		ng/g		97	44 - 130
Perfluorononanesulfonic acid (PFNS)	2.41	2.40		ng/g		100	58 - 130
EVE Acid	2.50	0.323		ng/g		13	10 - 180
8:2 FTUCA	2.50	2.58		ng/g		103	60 - 136
6:2 FTUCA	2.50	2.38		ng/g		95	54 - 146
10:2 FTUCA	2.50	2.50		ng/g		100	56 - 140
Perfluorotridecanoic acid (PFTrDA)	2.50	2.66		ng/g		106	56 - 130
Hydro-PS Acid	2.50	2.30		ng/g		92	55 - 130
Perfluorooctanesulfonamide (PFOSAm)	2.50	2.36		ng/g		94	61 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	2.34	2.21		ng/g		94	60 - 130
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	2.35	2.22		ng/g		95	60 - 130
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.36	2.21		ng/g		93	59 - 130
Hydro-EVE Acid	2.50	2.22		ng/g		89	48 - 133
Perfluorododecanesulfonic acid (PFDoS)	2.43	2.15		ng/g		89	51 - 130
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	2.50	3.57		ng/g		143	50 - 146
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	2.50	1.93		ng/g		77	10 - 152
Perfluoro-4-methoxybutanoic acid (PFMBA)	2.50	2.62		ng/g		105	45 - 130

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-582115/2-B
Matrix: Solid
Analysis Batch: 583606

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 582115

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
3-Perfluoropentylpropanoic acid (5:3 FTCA)			2.50	1.08		ng/g		43	10 - 130		
4,8-Dioxa-3H-perfluorononanoic acid (DONA)			2.36	2.17		ng/g		92	60 - 130		
MTP			2.50	2.35		ng/g		94	10 - 193		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
d5-NEtFOSAA	*79*		*10 - 188*
d3-NMeFOSAA	*69*		*10 - 172*
13C3-HFPO-DA	*75*		*17 - 147*
d7-N-MeFOSE-M	*86*		*10 - 177*
d9-N-EtFOSE-M	*90*		*10 - 168*
13C2-6:2 FTS	*86*		*10 - 200*
13C2-8:2 FTS	*85*		*10 - 200*
13C3-PFBS	*89*		*31 - 166*
13C2-4:2 FTS	*100*		*10 - 190*
13C5-PFHxA	*91*		*20 - 150*
13C9-PFNA	*88*		*27 - 159*
13C6-PFDA	*89*		*25 - 152*
13C7-PFUnA	*98*		*12 - 169*
13C3-PFHxS	*87*		*26 - 155*
13C2-PFDoA	*94*		*10 - 164*
d5-NEtPFOSA	*51*		*10 - 149*
d3-NMePFOSA	*52*		*10 - 150*
13C-6:2 FTCA	*65*		*10 - 162*
13C-8:2 FTCA	*65*		*10 - 166*
13C-10:2 FTCA	*65*		*10 - 178*
13C-6:2 FTUCA	*96*		*10 - 168*
13C-8:2 FTUCA	*102*		*10 - 173*
13C-10:2 FTUCA	*98*		*10 - 181*
13C4-PFBA	*84*		*25 - 147*
13C5-PFPeA	*87*		*17 - 154*
13C4-PFHpA	*96*		*20 - 158*
13C8-PFOA	*90*		*28 - 148*
13C8-PFOS	*92*		*34 - 153*
13C8-PFOSA	*75*		*13 - 151*
13C2-PFTeDA	*96*		*10 - 165*
13C3-PFPrA	*72*		*10 - 158*

Lab Sample ID: LCSD 410-582115/3-B
Matrix: Solid
Analysis Batch: 583606

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 582115

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
NVHOS			2.50	2.25		ng/g		90	49 - 130	2	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)			2.23	2.09		ng/g		94	56 - 130	6	30
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)			2.42	3.06		ng/g		127	43 - 139	17	30

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-582115/3-B
Matrix: Solid
Analysis Batch: 583606

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 582115

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluoro-2-(perfluoromethoxy)propanoic acid (PMPA)			2.50	2.05		ng/g		82	49 - 130	1	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			2.50	2.64		ng/g		106	45 - 130	1	30
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)			2.31	2.30		ng/g		99	59 - 130	3	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)			2.50	2.35		ng/g		94	44 - 130	1	30
Perfluoro-n-octadecanoic acid (PFODA)			2.50	2.34		ng/g		94	30 - 137	3	30
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)			2.50	2.59		ng/g		104	60 - 130	7	30
Perfluorooctanesulfonic acid (PFOS)			2.32	2.15		ng/g		93	57 - 130	2	30
Perfluoroundecanoic acid (PFUnA)			2.50	2.35		ng/g		94	59 - 130	1	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)			2.50	2.47		ng/g		99	60 - 130	6	30
R-PSDA			2.50	1.62		ng/g		65	10 - 142	5	30
Hydrolyzed PSDA			2.50	1.18		ng/g		47	10 - 152	14	30
R-PSDCA			2.50	1.87		ng/g		75	59 - 130	1	30
R-EVE			2.50	1.32		ng/g		53	10 - 151	11	30
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)			2.50	2.47		ng/g		99	59 - 130	3	30
Perfluoro-2-(perfluoroethoxy)propionic acid (PEPA)			2.50	2.01		ng/g		80	36 - 130	3	30
Perfluoropentanoic acid (PFPeA)			2.50	2.37		ng/g		95	58 - 130	7	30
Perfluoropentanesulfonic acid (PFPeS)			2.35	2.21		ng/g		94	62 - 130	4	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)			2.38	2.22		ng/g		93	58 - 130	4	30
8:2 FTCA			2.50	2.14		ng/g		86	45 - 130	8	30
PS Acid			2.50	0.343		ng/g		14	10 - 155	9	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)			2.50	2.45		ng/g		98	58 - 130	2	30
Perfluorohexanoic acid (PFHxA)			2.50	2.42		ng/g		97	56 - 130	3	30
Perfluorododecanoic acid (PFDoA)			2.50	2.62		ng/g		105	59 - 130	3	30
N-methylperfluorooctane sulfonamide (NMeFOSA)			2.50	2.27		ng/g		91	47 - 151	4	30
Perfluorooctanoic acid (PFOA)			2.50	2.38		ng/g		95	56 - 130	4	30
Perfluorodecanoic acid (PFDA)			2.50	2.40		ng/g		96	59 - 130	1	30
Perfluorodecanesulfonic acid (PFDS)			2.41	2.25		ng/g		93	57 - 130	8	30
Perfluorohexanesulfonic acid (PFHxS)			2.28	2.13		ng/g		93	60 - 130	3	30
3-Perfluoropropylpropanoic acid (3:3 FTCA)			2.50	1.08		ng/g		43	10 - 130	19	30
Perfluorobutanoic acid (PFBA)			2.50	2.48		ng/g		99	56 - 130	6	30
Perfluorobutanesulfonic acid (PFBS)			2.21	2.09		ng/g		94	61 - 130	1	30
Perfluoroheptanoic acid (PFHpA)			2.50	2.39		ng/g		96	61 - 130	3	30

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-582115/3-B
Matrix: Solid
Analysis Batch: 583606

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 582115

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluoroheptanesulfonic acid (PFHpS)			2.39	2.39		ng/g		100	61 - 130	6	30
Perfluorononanoic acid (PFNA)			2.50	2.40		ng/g		96	62 - 130	2	30
Perfluorotetradecanoic acid (PFTeDA)			2.50	2.46		ng/g		98	58 - 130	4	30
Perfluoro-3-methoxypropanoic acid (PFMPA)			2.50	2.57		ng/g		103	45 - 136	1	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)			2.40	2.63		ng/g		110	55 - 130	7	30
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)			2.50	2.08		ng/g		83	47 - 130	1	30
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)			2.50	2.29		ng/g		92	49 - 131	6	30
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)			2.50	2.00		ng/g		80	43 - 135	3	30
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DA)			2.50	2.03		ng/g		81	47 - 132	1	30
N-ethylperfluorooctane sulfonamide (NEtFOSA)			2.50	2.18		ng/g		87	63 - 130	6	30
Perfluoropropionic acid (PFPrA)			2.50	2.25		ng/g		90	34 - 143	1	30
Perfluoropropanesulfonic acid (PFPrS)			2.30	2.61		ng/g		113	52 - 142	3	30
6:2 FTCA			2.50	2.31		ng/g		92	43 - 130	8	30
10:2 FTCA			2.50	2.36		ng/g		94	42 - 130	2	30
Perfluoro-2-methoxyacetic acid (PFMOAA)			2.50	2.01		ng/g		80	31 - 139	2	30
Perfluoro-n-hexadecanoic acid (PFHxDA)			2.50	2.56		ng/g		103	44 - 130	6	30
Perfluorononanesulfonic acid (PFNS)			2.41	2.42		ng/g		101	58 - 130	1	30
EVE Acid			2.50	0.309		ng/g		12	10 - 180	4	30
8:2 FTUCA			2.50	2.50		ng/g		100	60 - 136	3	30
6:2 FTUCA			2.50	2.24		ng/g		90	54 - 146	6	30
10:2 FTUCA			2.50	2.23		ng/g		89	56 - 140	11	30
Perfluorotridecanoic acid (PFTrDA)			2.50	2.74		ng/g		110	56 - 130	3	30
Hydro-PS Acid			2.50	2.26		ng/g		91	55 - 130	2	30
Perfluorooctanesulfonamide (PFOSAm)			2.50	2.28		ng/g		91	61 - 130	3	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)			2.34	2.28		ng/g		98	60 - 130	3	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)			2.35	2.07		ng/g		88	60 - 130	7	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)			2.36	2.36		ng/g		100	59 - 130	7	30
Hydro-EVE Acid			2.50	2.23		ng/g		89	48 - 133	1	30
Perfluorododecanesulfonic acid (PFDoS)			2.43	2.27		ng/g		93	51 - 130	5	30
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)			2.50	3.50		ng/g		140	50 - 146	2	30
3-Perfluoroheptylpropanoic acid (7:3 FTCA)			2.50	1.90		ng/g		76	10 - 152	1	30

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-582115/3-B
Matrix: Solid
Analysis Batch: 583606

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 582115

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluoro-4-methoxybutanoic acid (PFMBA)			2.50	2.59		ng/g		104	45 - 130	1	30
3-Perfluoropentylpropanoic acid (5:3 FTCA)			2.50	1.02		ng/g		41	10 - 130	6	30
4,8-Dioxa-3H-perfluorononanoic acid (DONA)			2.36	2.28		ng/g		96	60 - 130	5	30
MTP			2.50	2.35		ng/g		94	10 - 193	0	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
d5-NEtFOSAA	*74*		*10 - 188*
d3-NMeFOSAA	*68*		*10 - 172*
13C3-HFPO-DA	*84*		*17 - 147*
d7-N-MeFOSE-M	*90*		*10 - 177*
d9-N-EtFOSE-M	*95*		*10 - 168*
13C2-6:2 FTS	*87*		*10 - 200*
13C2-8:2 FTS	*83*		*10 - 200*
13C3-PFBS	*96*		*31 - 166*
13C2-4:2 FTS	*107*		*10 - 190*
13C5-PFHxA	*98*		*20 - 150*
13C9-PFNA	*96*		*27 - 159*
13C6-PFDA	*98*		*25 - 152*
13C7-PFUnA	*102*		*12 - 169*
13C3-PFHxS	*93*		*26 - 155*
13C2-PFDoA	*100*		*10 - 164*
d5-NEtPFOSA	*51*		*10 - 149*
d3-NMePFOSA	*50*		*10 - 150*
13C-6:2 FTCA	*59*		*10 - 162*
13C-8:2 FTCA	*66*		*10 - 166*
13C-10:2 FTCA	*63*		*10 - 178*
13C-6:2 FTUCA	*102*		*10 - 168*
13C-8:2 FTUCA	*105*		*10 - 173*
13C-10:2 FTUCA	*105*		*10 - 181*
13C4-PFBA	*89*		*25 - 147*
13C5-PFPeA	*93*		*17 - 154*
13C4-PFHpA	*99*		*20 - 158*
13C8-PFOA	*95*		*28 - 148*
13C8-PFOS	*100*		*34 - 153*
13C8-PFOSA	*87*		*13 - 151*
13C2-PFTeDA	*102*		*10 - 165*
13C3-PFPrA	*77*		*10 - 158*

Lab Sample ID: MB 410-584381/1-B
Matrix: Solid
Analysis Batch: 585207

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 584381

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NVHOS	<0.021		0.059	0.021	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	<0.020		0.059	0.020	ng/g		12/10/24 16:09	12/12/24 11:53	1

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: MB 410-584381/1-B
Matrix: Solid
Analysis Batch: 585207

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 584381

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	<0.022		0.059	0.022	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro-2-(perfluoromethoxy)propanoic acid (PMPA)	<0.018		0.059	0.018	ng/g		12/10/24 16:09	12/12/24 11:53	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<0.20		0.99	0.20	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	<0.019		0.059	0.019	ng/g		12/10/24 16:09	12/12/24 11:53	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<0.024		0.059	0.024	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro-n-octadecanoic acid (PFODA)	<0.012		0.059	0.012	ng/g		12/10/24 16:09	12/12/24 11:53	1
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	<0.020		0.059	0.020	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorooctanesulfonic acid (PFOS)	<0.035		0.059	0.035	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoroundecanoic acid (PFUnA)	<0.056		0.099	0.056	ng/g		12/10/24 16:09	12/12/24 11:53	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.031		0.059	0.031	ng/g		12/10/24 16:09	12/12/24 11:53	1
R-PSDA	<0.030		0.059	0.030	ng/g		12/10/24 16:09	12/12/24 11:53	1
Hydrolyzed PSDA	<0.020		0.059	0.020	ng/g		12/10/24 16:09	12/12/24 11:53	1
R-PSDCA	<0.022		0.059	0.022	ng/g		12/10/24 16:09	12/12/24 11:53	1
R-EVE	<0.020		0.059	0.020	ng/g		12/10/24 16:09	12/12/24 11:53	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	<0.023		0.059	0.023	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro-2-(perfluoroethoxy)propionic acid (PEPA)	<0.020		0.059	0.020	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoropentanoic acid (PFPeA)	<0.024		0.059	0.024	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoropentanesulfonic acid (PFPeS)	<0.022		0.059	0.022	ng/g		12/10/24 16:09	12/12/24 11:53	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<0.049		0.099	0.049	ng/g		12/10/24 16:09	12/12/24 11:53	1
8:2 FTCA	<0.016		0.059	0.016	ng/g		12/10/24 16:09	12/12/24 11:53	1
PS Acid	<0.050		0.099	0.050	ng/g		12/10/24 16:09	12/12/24 11:53	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.022		0.059	0.022	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorohexanoic acid (PFHxA)	<0.019		0.059	0.019	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorododecanoic acid (PFDoA)	<0.023		0.059	0.023	ng/g		12/10/24 16:09	12/12/24 11:53	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	<0.031		0.059	0.031	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorooctanoic acid (PFOA)	<0.022		0.059	0.022	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorodecanoic acid (PFDA)	<0.024		0.059	0.024	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorodecanesulfonic acid (PFDS)	<0.021		0.059	0.021	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorohexanesulfonic acid (PFHxS)	<0.019		0.059	0.019	ng/g		12/10/24 16:09	12/12/24 11:53	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<0.020		0.059	0.020	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorobutanoic acid (PFBA)	<0.024		0.059	0.024	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorobutanesulfonic acid (PFBS)	<0.36		0.79	0.36	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoroheptanoic acid (PFHpA)	<0.024		0.059	0.024	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.020		0.059	0.020	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorononanoic acid (PFNA)	<0.023		0.059	0.023	ng/g		12/10/24 16:09	12/12/24 11:53	1

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: MB 410-584381/1-B
Matrix: Solid
Analysis Batch: 585207

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 584381

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeDA)	<0.024		0.059	0.024	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<0.023		0.059	0.023	ng/g		12/10/24 16:09	12/12/24 11:53	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<0.017		0.059	0.017	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	<0.016		0.059	0.016	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	<0.020		0.059	0.020	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	<0.019		0.059	0.019	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DA)	<0.024		0.059	0.024	ng/g		12/10/24 16:09	12/12/24 11:53	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	<0.025		0.059	0.025	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoropropionic acid (PFPrA)	<0.20		0.50	0.20	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoropropanesulfonic acid (PFPrS)	<0.021		0.059	0.021	ng/g		12/10/24 16:09	12/12/24 11:53	1
6:2 FTCA	<0.013		0.059	0.013	ng/g		12/10/24 16:09	12/12/24 11:53	1
10:2 FTCA	<0.019		0.059	0.019	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro-2-methoxyacetic acid (PFMOAA)	<0.016		0.059	0.016	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<0.013		0.059	0.013	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorononanesulfonic acid (PFNS)	<0.022		0.059	0.022	ng/g		12/10/24 16:09	12/12/24 11:53	1
EVE Acid	<0.050		0.099	0.050	ng/g		12/10/24 16:09	12/12/24 11:53	1
8:2 FTUCA	<0.031		0.059	0.031	ng/g		12/10/24 16:09	12/12/24 11:53	1
6:2 FTUCA	<0.027		0.059	0.027	ng/g		12/10/24 16:09	12/12/24 11:53	1
10:2 FTUCA	<0.032		0.059	0.032	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorotridecanoic acid (PFTrDA)	<0.021		0.059	0.021	ng/g		12/10/24 16:09	12/12/24 11:53	1
Hydro-PS Acid	<0.024		0.059	0.024	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorooctanesulfonamide (PFOSAm)	<0.021		0.059	0.021	ng/g		12/10/24 16:09	12/12/24 11:53	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<0.024		0.059	0.024	ng/g		12/10/24 16:09	12/12/24 11:53	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<0.017		0.059	0.017	ng/g		12/10/24 16:09	12/12/24 11:53	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<0.022		0.059	0.022	ng/g		12/10/24 16:09	12/12/24 11:53	1
Hydro-EVE Acid	<0.020		0.059	0.020	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluorododecanesulfonic acid (PFDoS)	<0.020		0.059	0.020	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	<0.024		0.059	0.024	ng/g		12/10/24 16:09	12/12/24 11:53	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<0.016		0.059	0.016	ng/g		12/10/24 16:09	12/12/24 11:53	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<0.022		0.059	0.022	ng/g		12/10/24 16:09	12/12/24 11:53	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<0.019		0.059	0.019	ng/g		12/10/24 16:09	12/12/24 11:53	1
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	<0.022		0.059	0.022	ng/g		12/10/24 16:09	12/12/24 11:53	1
MTP	<0.017		0.059	0.017	ng/g		12/10/24 16:09	12/12/24 11:53	1

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	68		10 - 188	12/10/24 16:09	12/12/24 11:53	1
d3-NMeFOSAA	57		10 - 172	12/10/24 16:09	12/12/24 11:53	1
13C3-HFPO-DA	86		17 - 147	12/10/24 16:09	12/12/24 11:53	1
d7-N-MeFOSE-M	90		10 - 177	12/10/24 16:09	12/12/24 11:53	1
d9-N-EtFOSE-M	80		10 - 168	12/10/24 16:09	12/12/24 11:53	1
13C2-6:2 FTS	87		10 - 200	12/10/24 16:09	12/12/24 11:53	1
13C2-8:2 FTS	81		10 - 200	12/10/24 16:09	12/12/24 11:53	1
13C3-PFBS	88		31 - 166	12/10/24 16:09	12/12/24 11:53	1
13C2-4:2 FTS	84		10 - 190	12/10/24 16:09	12/12/24 11:53	1
13C5-PFHxA	81		20 - 150	12/10/24 16:09	12/12/24 11:53	1
13C9-PFNA	85		27 - 159	12/10/24 16:09	12/12/24 11:53	1
13C6-PFDA	86		25 - 152	12/10/24 16:09	12/12/24 11:53	1
13C7-PFUnA	87		12 - 169	12/10/24 16:09	12/12/24 11:53	1
13C3-PFHxS	87		26 - 155	12/10/24 16:09	12/12/24 11:53	1
13C2-PFDoA	79		10 - 164	12/10/24 16:09	12/12/24 11:53	1
d5-NEtPFOSA	62		10 - 149	12/10/24 16:09	12/12/24 11:53	1
d3-NMePFOSA	73		10 - 150	12/10/24 16:09	12/12/24 11:53	1
13C-6:2 FTCA	51		10 - 162	12/10/24 16:09	12/12/24 11:53	1
13C-8:2 FTCA	48		10 - 166	12/10/24 16:09	12/12/24 11:53	1
13C-10:2 FTCA	57		10 - 178	12/10/24 16:09	12/12/24 11:53	1
13C-6:2 FTUCA	78		10 - 168	12/10/24 16:09	12/12/24 11:53	1
13C-8:2 FTUCA	74		10 - 173	12/10/24 16:09	12/12/24 11:53	1
13C-10:2 FTUCA	77		10 - 181	12/10/24 16:09	12/12/24 11:53	1
13C4-PFBA	82		25 - 147	12/10/24 16:09	12/12/24 11:53	1
13C5-PFPeA	84		17 - 154	12/10/24 16:09	12/12/24 11:53	1
13C4-PFHpA	87		20 - 158	12/10/24 16:09	12/12/24 11:53	1
13C8-PFOA	87		28 - 148	12/10/24 16:09	12/12/24 11:53	1
13C8-PFOS	90		34 - 153	12/10/24 16:09	12/12/24 11:53	1
13C8-PFOSA	49		13 - 151	12/10/24 16:09	12/12/24 11:53	1
13C2-PFTeDA	75		10 - 165	12/10/24 16:09	12/12/24 11:53	1
13C3-PFPrA	66		10 - 158	12/10/24 16:09	12/12/24 11:53	1

Lab Sample ID: LCS 410-584381/2-B
Matrix: Solid
Analysis Batch: 585207

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 584381

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
NVHOS	2.49	1.98		ng/g		80	49 - 130
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)	2.22	1.95		ng/g		88	56 - 130
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	2.41	2.29		ng/g		95	43 - 139
Perfluoro-2-(perfluoromethoxy)propanoic acid (PMPA)	2.49	1.99		ng/g		80	49 - 130
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.49	2.26		ng/g		91	45 - 130
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	2.30	2.07		ng/g		90	59 - 130
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	2.49	2.06		ng/g		83	44 - 130
Perfluoro-n-octadecanoic acid (PFODA)	2.49	2.09		ng/g		84	30 - 137

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-584381/2-B
Matrix: Solid
Analysis Batch: 585207

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 584381

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	2.49	2.07		ng/g		83	60 - 130
Perfluorooctanesulfonic acid (PFOS)	2.31	1.97		ng/g		85	57 - 130
Perfluoroundecanoic acid (PFUnA)	2.49	2.11		ng/g		85	59 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.49	2.29		ng/g		92	60 - 130
R-PSDA	2.49	1.53		ng/g		61	10 - 142
Hydrolyzed PSDA	2.49	1.06		ng/g		42	10 - 152
R-PSDCA	2.49	1.73		ng/g		69	59 - 130
R-EVE	2.49	1.40		ng/g		56	10 - 151
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	2.49	2.30		ng/g		92	59 - 130
Perfluoro-2-(perfluoroethoxy)propionic acid (PEPA)	2.49	1.85		ng/g		74	36 - 130
Perfluoropentanoic acid (PFPeA)	2.49	2.19		ng/g		88	58 - 130
Perfluoropentanesulfonic acid (PFPeS)	2.34	2.05		ng/g		88	62 - 130
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	2.37	2.01		ng/g		85	58 - 130
8:2 FTCA	2.49	2.01		ng/g		81	45 - 130
PS Acid	2.49	0.516		ng/g		21	10 - 155
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.49	2.23		ng/g		90	58 - 130
Perfluorohexanoic acid (PFHxA)	2.49	2.35		ng/g		94	56 - 130
Perfluorododecanoic acid (PFDoA)	2.49	2.53		ng/g		102	59 - 130
N-methylperfluorooctane sulfonamide (NMeFOSA)	2.49	2.16		ng/g		87	47 - 151
Perfluorooctanoic acid (PFOA)	2.49	2.30		ng/g		92	56 - 130
Perfluorodecanoic acid (PFDA)	2.49	2.35		ng/g		94	59 - 130
Perfluorodecanesulfonic acid (PFDS)	2.40	1.90		ng/g		79	57 - 130
Perfluorohexanesulfonic acid (PFHxS)	2.27	2.01		ng/g		89	60 - 130
3-Perfluoropropylpropanoic acid (3:3 FTCA)	2.49	1.67		ng/g		67	10 - 130
Perfluorobutanoic acid (PFBA)	2.49	2.26		ng/g		91	56 - 130
Perfluorobutanesulfonic acid (PFBS)	2.21	2.03		ng/g		92	61 - 130
Perfluoroheptanoic acid (PFHpA)	2.49	2.20		ng/g		88	61 - 130
Perfluoroheptanesulfonic acid (PFHpS)	2.38	2.16		ng/g		91	61 - 130
Perfluorononanoic acid (PFNA)	2.49	2.25		ng/g		90	62 - 130
Perfluorotetradecanoic acid (PFTeDA)	2.49	2.36		ng/g		95	58 - 130
Perfluoro-3-methoxypropanoic acid (PFMPA)	2.49	2.31		ng/g		92	45 - 136
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	2.39	2.12		ng/g		89	55 - 130
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	2.49	2.08		ng/g		83	47 - 130

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-584381/2-B
Matrix: Solid
Analysis Batch: 585207

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 584381

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	2.49	2.25		ng/g		90	49 - 131
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	2.49	2.08		ng/g		84	43 - 135
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DA)	2.49	2.12		ng/g		85	47 - 132
N-ethylperfluorooctane sulfonamide (NEtFOSA)	2.49	2.15		ng/g		86	63 - 130
Perfluoropropionic acid (PFPrA)	2.49	2.13		ng/g		85	34 - 143
Perfluoropropanesulfonic acid (PFPrS)	2.29	2.47		ng/g		108	52 - 142
6:2 FTCA	2.49	2.09		ng/g		84	43 - 130
10:2 FTCA	2.49	2.46		ng/g		99	42 - 130
Perfluoro-2-methoxyacetic acid (PFMOAA)	2.49	1.76		ng/g		71	31 - 139
Perfluoro-n-hexadecanoic acid (PFHxDA)	2.49	2.38		ng/g		95	44 - 130
Perfluorononanesulfonic acid (PFNS)	2.40	2.13		ng/g		89	58 - 130
EVE Acid	2.49	0.607		ng/g		24	10 - 180
8:2 FTUCA	2.49	2.50		ng/g		100	60 - 136
6:2 FTUCA	2.49	2.37		ng/g		95	54 - 146
10:2 FTUCA	2.49	2.48		ng/g		100	56 - 140
Perfluorotridecanoic acid (PFTrDA)	2.49	2.88		ng/g		116	56 - 130
Hydro-PS Acid	2.49	2.03		ng/g		82	55 - 130
Perfluorooctanesulfonamide (PFOSAm)	2.49	2.12		ng/g		85	61 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	2.33	1.95		ng/g		84	60 - 130
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	2.34	2.17		ng/g		93	60 - 130
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.36	1.62		ng/g		69	59 - 130
Hydro-EVE Acid	2.49	2.08		ng/g		83	48 - 133
Perfluorododecanesulfonic acid (PFDoS)	2.42	1.73		ng/g		71	51 - 130
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	2.49	3.30		ng/g		132	50 - 146
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	2.49	2.31		ng/g		93	10 - 152
Perfluoro-4-methoxybutanoic acid (PFMBA)	2.49	2.28		ng/g		92	45 - 130
3-Perfluoropentylpropanoic acid (5:3 FTCA)	2.49	1.43		ng/g		57	10 - 130
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	2.36	2.17		ng/g		92	60 - 130
MTP	2.49	1.36		ng/g		55	10 - 193

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
d5-NEtFOSAA	*70*		*10 - 188*
d3-NMeFOSAA	*66*		*10 - 172*

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-584381/2-B
Matrix: Solid
Analysis Batch: 585207

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 584381

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3-HFPO-DA	*81*		*17 - 147*
d7-N-MeFOSE-M	*83*		*10 - 177*
d9-N-EtFOSE-M	*81*		*10 - 168*
13C2-6:2 FTS	*83*		*10 - 200*
13C2-8:2 FTS	*83*		*10 - 200*
13C3-PFBS	*91*		*31 - 166*
13C2-4:2 FTS	*78*		*10 - 190*
13C5-PFHxA	*78*		*20 - 150*
13C9-PFNA	*86*		*27 - 159*
13C6-PFDA	*83*		*25 - 152*
13C7-PFUnA	*84*		*12 - 169*
13C3-PFHxS	*84*		*26 - 155*
13C2-PFDoA	*73*		*10 - 164*
d5-NEtPFOSA	*64*		*10 - 149*
d3-NMePFOSA	*72*		*10 - 150*
13C-6:2 FTCA	*57*		*10 - 162*
13C-8:2 FTCA	*58*		*10 - 166*
13C-10:2 FTCA	*55*		*10 - 178*
13C-6:2 FTUCA	*80*		*10 - 168*
13C-8:2 FTUCA	*83*		*10 - 173*
13C-10:2 FTUCA	*81*		*10 - 181*
13C4-PFBA	*83*		*25 - 147*
13C5-PFPeA	*83*		*17 - 154*
13C4-PFHpA	*85*		*20 - 158*
13C8-PFOA	*82*		*28 - 148*
13C8-PFOS	*90*		*34 - 153*
13C8-PFOSA	*85*		*13 - 151*
13C2-PFTeDA	*72*		*10 - 165*
13C3-PFPrA	*53*		*10 - 158*

Lab Sample ID: LCSD 410-584381/3-B
Matrix: Solid
Analysis Batch: 585207

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 584381

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
NVHOS			2.48	2.10		ng/g		85	49 - 130	6	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEESA)			2.21	2.04		ng/g		92	56 - 130	4	30
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)			2.39	2.45		ng/g		103	43 - 139	7	30
Perfluoro-2-(perfluoromethoxy)propanoic acid (PMPA)			2.48	2.07		ng/g		84	49 - 130	4	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			2.48	2.30		ng/g		93	45 - 130	2	30
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)			2.29	2.12		ng/g		93	59 - 130	2	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)			2.48	2.12		ng/g		86	44 - 130	3	30
Perfluoro-n-octadecanoic acid (PFODA)			2.48	2.22		ng/g		89	30 - 137	6	30

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-584381/3-B
Matrix: Solid
Analysis Batch: 585207

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 584381

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)			2.48	2.08		ng/g		84	60 - 130	0	30
Perfluorooctanesulfonic acid (PFOS)			2.29	2.01		ng/g		88	57 - 130	2	30
Perfluoroundecanoic acid (PFUnA)			2.48	2.17		ng/g		88	59 - 130	3	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)			2.48	2.36		ng/g		95	60 - 130	3	30
R-PSDA			2.48	1.25		ng/g		51	10 - 142	20	30
Hydrolyzed PSDA			2.48	0.904		ng/g		36	10 - 152	16	30
R-PSDCA			2.48	1.82		ng/g		74	59 - 130	5	30
R-EVE			2.48	1.10		ng/g		45	10 - 151	24	30
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)			2.48	2.44		ng/g		99	59 - 130	6	30
Perfluoro-2-(perfluoroethoxy)propionic acid (PEPA)			2.48	1.90		ng/g		77	36 - 130	3	30
Perfluoropentanoic acid (PFPeA)			2.48	2.23		ng/g		90	58 - 130	2	30
Perfluoropentanesulfonic acid (PFPeS)			2.33	2.12		ng/g		91	62 - 130	3	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)			2.36	2.02		ng/g		86	58 - 130	1	30
8:2 FTCA			2.48	2.09		ng/g		84	45 - 130	3	30
PS Acid			2.48	0.200	*- *1	ng/g		8	10 - 155	88	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)			2.48	2.26		ng/g		91	58 - 130	1	30
Perfluorohexanoic acid (PFHxA)			2.48	2.40		ng/g		97	56 - 130	2	30
Perfluorododecanoic acid (PFDoA)			2.48	2.51		ng/g		101	59 - 130	1	30
N-methylperfluorooctane sulfonamide (NMeFOSA)			2.48	2.18		ng/g		88	47 - 151	1	30
Perfluorooctanoic acid (PFOA)			2.48	2.26		ng/g		91	56 - 130	2	30
Perfluorodecanoic acid (PFDA)			2.48	2.29		ng/g		93	59 - 130	3	30
Perfluorodecanesulfonic acid (PFDS)			2.39	1.98		ng/g		83	57 - 130	4	30
Perfluorohexanesulfonic acid (PFHxS)			2.26	2.13		ng/g		94	60 - 130	5	30
3-Perfluoropropylpropanoic acid (3:3 FTCA)			2.48	1.47		ng/g		59	10 - 130	13	30
Perfluorobutanoic acid (PFBA)			2.48	2.27		ng/g		92	56 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)			2.19	2.00		ng/g		91	61 - 130	1	30
Perfluoroheptanoic acid (PFHpA)			2.48	2.21		ng/g		89	61 - 130	0	30
Perfluoroheptanesulfonic acid (PFHpS)			2.36	2.18		ng/g		92	61 - 130	1	30
Perfluorononanoic acid (PFNA)			2.48	2.32		ng/g		93	62 - 130	3	30
Perfluorotetradecanoic acid (PFTeDA)			2.48	2.43		ng/g		98	58 - 130	3	30
Perfluoro-3-methoxypropanoic acid (PFMPA)			2.48	2.39		ng/g		97	45 - 136	4	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)			2.38	2.42		ng/g		102	55 - 130	13	30
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)			2.48	2.05		ng/g		83	47 - 130	1	30

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-584381/3-B
Matrix: Solid
Analysis Batch: 585207

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 584381

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)			2.48	2.27		ng/g		92	49 - 131	1	30
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)			2.48	2.13		ng/g		86	43 - 135	2	30
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid (PFO5DA)			2.48	2.16		ng/g		87	47 - 132	2	30
N-ethylperfluorooctane sulfonamide (NEtFOSA)			2.48	2.31		ng/g		93	63 - 130	7	30
Perfluoropropionic acid (PFPrA)			2.48	2.19		ng/g		89	34 - 143	3	30
Perfluoropropanesulfonic acid (PFPrS)			2.28	2.52		ng/g		111	52 - 142	2	30
6:2 FTCA			2.48	2.15		ng/g		87	43 - 130	3	30
10:2 FTCA			2.48	2.24		ng/g		90	42 - 130	9	30
Perfluoro-2-methoxyacetic acid (PFMOAA)			2.48	1.82		ng/g		74	31 - 139	3	30
Perfluoro-n-hexadecanoic acid (PFHxDA)			2.48	2.42		ng/g		98	44 - 130	2	30
Perfluorononanesulfonic acid (PFNS)			2.38	2.17		ng/g		91	58 - 130	2	30
EVE Acid			2.48	0.224	*- *1	ng/g		9	10 - 180	92	30
8:2 FTUCA			2.48	2.61		ng/g		105	60 - 136	4	30
6:2 FTUCA			2.48	2.51		ng/g		101	54 - 146	6	30
10:2 FTUCA			2.48	2.59		ng/g		105	56 - 140	4	30
Perfluorotridecanoic acid (PFTrDA)			2.48	2.98		ng/g		120	56 - 130	3	30
Hydro-PS Acid			2.48	2.14		ng/g		86	55 - 130	5	30
Perfluorooctanesulfonamide (PFOSAm)			2.48	2.25		ng/g		91	61 - 130	6	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)			2.32	2.04		ng/g		88	60 - 130	5	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)			2.32	2.10		ng/g		90	60 - 130	3	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)			2.34	1.64		ng/g		70	59 - 130	1	30
Hydro-EVE Acid			2.48	2.12		ng/g		85	48 - 133	2	30
Perfluorododecanesulfonic acid (PFDoS)			2.40	1.83		ng/g		76	51 - 130	6	30
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)			2.48	3.38		ng/g		137	50 - 146	2	30
3-Perfluoroheptylpropanoic acid (7:3 FTCA)			2.48	2.27		ng/g		92	10 - 152	2	30
Perfluoro-4-methoxybutanoic acid (PFMBA)			2.48	2.34		ng/g		94	45 - 130	2	30
3-Perfluoropentylpropanoic acid (5:3 FTCA)			2.48	1.32		ng/g		53	10 - 130	8	30
4,8-Dioxa-3H-perfluorononanoic acid (DONA)			2.34	2.14		ng/g		91	60 - 130	1	30
MTP			2.48	1.85	*1	ng/g		75	10 - 193	31	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
d5-NEtFOSAA	*77*		*10 - 188*
d3-NMeFOSAA	*67*		*10 - 172*

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-584381/3-B
Matrix: Solid
Analysis Batch: 585207

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 584381

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C3-HFPO-DA	84		17 - 147
d7-N-MeFOSE-M	82		10 - 177
d9-N-EtFOSE-M	80		10 - 168
13C2-6:2 FTS	83		10 - 200
13C2-8:2 FTS	74		10 - 200
13C3-PFBS	87		31 - 166
13C2-4:2 FTS	85		10 - 190
13C5-PFHxA	80		20 - 150
13C9-PFNA	86		27 - 159
13C6-PFDA	82		25 - 152
13C7-PFUnA	83		12 - 169
13C3-PFHxS	84		26 - 155
13C2-PFDoA	70		10 - 164
d5-NEtPFOSA	51		10 - 149
d3-NMePFOSA	59		10 - 150
13C-6:2 FTCA	59		10 - 162
13C-8:2 FTCA	60		10 - 166
13C-10:2 FTCA	61		10 - 178
13C-6:2 FTUCA	73		10 - 168
13C-8:2 FTUCA	76		10 - 173
13C-10:2 FTUCA	78		10 - 181
13C4-PFBA	80		25 - 147
13C5-PFPeA	79		17 - 154
13C4-PFHpA	87		20 - 158
13C8-PFOA	84		28 - 148
13C8-PFOS	89		34 - 153
13C8-PFOSA	77		13 - 151
13C2-PFTeDA	74		10 - 165
13C3-PFPrA	61		10 - 158

Method: EPA 537 (mod) - EPA 537 Isotope Dilution

Lab Sample ID: MB 410-575681/1-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 575681

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NVHOS	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
PES	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
DNU Perfluoro-3-methoxypropanoic acid (PMPA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
PFECHS	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoro-n-octadecanoic acid (PFODA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: MB 410-575681/1-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 575681

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorooctanesulfonic acid (PFOS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoroundecanoic acid (PFUnA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
R-PSDA	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Hydrolyzed PSDA	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
R-PSDCA	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
R-EVE	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
PEPA	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoropentanoic acid (PFPeA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoropentanesulfonic acid (PFPeS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
8:2 FTCA	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
PS Acid	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorohexanoic acid (PFHxA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorododecanoic acid (PFDoA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
N-methylperfluorooctane sulfonamide (NMeFOSA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorooctanoic acid (PFOA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorodecanoic acid (PFDA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorodecanesulfonic acid (PFDS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorohexanesulfonic acid (PFHxS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
3-Perfluoropropylpropanoic acid (3:3 FTCA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorobutanoic acid (PFBA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorobutanesulfonic acid (PFBS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoroheptanoic acid (PFHpA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoroheptanesulfonic acid (PFHpS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorononanoic acid (PFNA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorotetradecanoic acid (PFTeDA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoro-3-methoxypropanoic acid (PFMPA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
N-ethylperfluorooctane sulfonamide (NEtFOSA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: MB 410-575681/1-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 575681

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoropropionic acid (PFPrA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoropropanesulfonic acid	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
6:2 FTCA	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
10:2 FTCA	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoro-2-methoxyacetic acid (PFMOAA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoro-n-hexadecanoic acid (PFHxDA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorononanesulfonic acid (PFNS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
EVE Acid	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
8:2 FTUCA	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
6:2 FTUCA	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
10:2 FTUCA	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorotridecanoic acid (PFTrDA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Hydro-PS Acid	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorooctanesulfonamide (PFOSAm)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Hydro-EVE Acid	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluorododecanesulfonic acid	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
Perfluoro-4-methoxybutanoic acid (PFMBA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
3-Perfluoropentylpropanoic acid (5:3 FTCA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1
MTP	<200		200	200	ng/L		11/15/24 14:04	11/18/24 17:54	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d5-NEtFOSAA	*94*		*34 - 178*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
d3-NMeFOSAA	*76*		*38 - 162*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
13C3 HFPO-DA	*75*		*41 - 163*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
d7-N-MeFOSE-M	*76*		*36 - 165*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
d9-N-EtFOSE-M	*72*		*44 - 158*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
M2-6:2 FTS	*70*		*45 - 167*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
M2-8:2 FTS	*74*		*58 - 158*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
13C3 PFBS	*69*		*63 - 160*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
M2-4:2 FTS	*70*		*46 - 166*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
13C5 PFHxA	*74*		*50 - 156*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
13C9 PFNA	*76*		*60 - 142*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
13C6 PFDA	*73*		*64 - 141*	*11/15/24 14:04*	*11/18/24 17:54*	*1*
13C7 PFUnA	*76*		*27 - 168*	*11/15/24 14:04*	*11/18/24 17:54*	*1*

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: MB 410-575681/1-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 575681

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 PFHxS	68		57 - 159	11/15/24 14:04	11/18/24 17:54	1
13C2-PFDoDA	72		29 - 158	11/15/24 14:04	11/18/24 17:54	1
d5-NEtPFOSA	72		41 - 153	11/15/24 14:04	11/18/24 17:54	1
d3-NMePFOSA	72		36 - 151	11/15/24 14:04	11/18/24 17:54	1
13C-6:2 FTCA	64		10 - 200	11/15/24 14:04	11/18/24 17:54	1
13C-8:2 FTCA	60		10 - 200	11/15/24 14:04	11/18/24 17:54	1
13C-10:2 FTCA	61		10 - 200	11/15/24 14:04	11/18/24 17:54	1
13C-6:2 FTUCA	94		10 - 169	11/15/24 14:04	11/18/24 17:54	1
13C-8:2 FTUCA	89		10 - 164	11/15/24 14:04	11/18/24 17:54	1
13C-10:2 FTUCA	90		10 - 192	11/15/24 14:04	11/18/24 17:54	1
13C4 PFBA	75		67 - 136	11/15/24 14:04	11/18/24 17:54	1
13C5 PFPeA	70		63 - 139	11/15/24 14:04	11/18/24 17:54	1
13C4 PFHpA	76		60 - 150	11/15/24 14:04	11/18/24 17:54	1
13C8 PFOA	74		62 - 146	11/15/24 14:04	11/18/24 17:54	1
13C8 PFOS	77		64 - 141	11/15/24 14:04	11/18/24 17:54	1
13C8 FOSA	71		46 - 150	11/15/24 14:04	11/18/24 17:54	1
13C2 PFTeDA	67		33 - 150	11/15/24 14:04	11/18/24 17:54	1
13C3-PFPrA	70		50 - 150	11/15/24 14:04	11/18/24 17:54	1

Lab Sample ID: LCS 410-575681/2-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 575681

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
NVHOS	6400	5660		ng/L		88	48 - 126
PES	5710	5230		ng/L		92	45 - 125
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	6180	6790		ng/L		110	56 - 136
DNU	6400	5280		ng/L		82	50 - 131
Perfluoro-3-methoxypropanoic acid (PMPA)							
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	6400	5640		ng/L		88	41 - 137
PFECHS	5910	5970		ng/L		101	49 - 110
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	6400	5730		ng/L		89	51 - 137
Perfluoro-n-octadecanoic acid (PFODA)	6400	6340		ng/L		99	49 - 148
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	6400	6390		ng/L		100	53 - 149
Perfluorooctanesulfonic acid (PFOS)	5930	5470		ng/L		92	54 - 125
Perfluoroundecanoic acid (PFUnA)	6400	5740		ng/L		90	58 - 133
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	6400	6050		ng/L		95	63 - 123
R-PSDA	6400	5210		ng/L		81	43 - 123
Hydrolyzed PSDA	6400	4630		ng/L		72	37 - 133
R-PSDCA	6400	4640		ng/L		73	47 - 129
R-EVE	6400	5260		ng/L		82	57 - 133
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	6400	6240		ng/L		98	58 - 141

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-575681/2-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 575681

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
PEPA	6400	4910		ng/L		77	45 - 140
Perfluoropentanoic acid (PFPeA)	6400	6120		ng/L		96	53 - 150
Perfluoropentanesulfonic acid (PFPeS)	6020	5290		ng/L		88	54 - 140
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	6090	5790		ng/L		95	63 - 142
8:2 FTCA	6400	7180		ng/L		112	10 - 135
PS Acid	6400	6400		ng/L		100	44 - 124
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	6400	6140		ng/L		96	54 - 123
Perfluorohexanoic acid (PFHxA)	6400	6320		ng/L		99	52 - 133
Perfluorododecanoic acid (PFDoA)	6400	6850		ng/L		107	59 - 133
N-methylperfluorooctane sulfonamide (NMeFOSA)	6400	6410		ng/L		100	54 - 150
Perfluorooctanoic acid (PFOA)	6400	6380		ng/L		100	54 - 130
Perfluorodecanoic acid (PFDA)	6400	6800		ng/L		106	57 - 129
Perfluorodecanesulfonic acid (PFDS)	6170	6360		ng/L		103	51 - 146
Perfluorohexanesulfonic acid (PFHxS)	5840	5780		ng/L		99	51 - 129
3-Perfluoropropylpropanoic acid (3:3 FTCA)	6400	7070		ng/L		111	68 - 111
Perfluorobutanoic acid (PFBA)	6400	6730		ng/L		105	53 - 144
Perfluorobutanesulfonic acid (PFBS)	5660	5210		ng/L		92	44 - 131
Perfluoroheptanoic acid (PFHpA)	6400	6470		ng/L		101	59 - 135
Perfluoroheptanesulfonic acid (PFHpS)	6110	6190		ng/L		101	54 - 138
Perfluorononanoic acid (PFNA)	6400	6130		ng/L		96	54 - 137
Perfluorotetradecanoic acid (PFTeDA)	6400	6980		ng/L		109	56 - 137
Perfluoro-3-methoxypropanoic acid (PFMPA)	6400	6000		ng/L		94	70 - 121
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	6140	6940		ng/L		113	55 - 144
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)	6400	5250		ng/L		82	47 - 132
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)	6400	5510		ng/L		86	51 - 133
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)	6400	5350		ng/L		84	50 - 139
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	6400	5370		ng/L		84	48 - 144
N-ethylperfluorooctane sulfonamide (NEtFOSA)	6400	6840		ng/L		107	62 - 135
Perfluoropropionic acid (PFPrA)	6400	5400		ng/L		84	67 - 116
Perfluoropropanesulfonic acid	5860	5630		ng/L		96	64 - 113
6:2 FTCA	6400	7190		ng/L		112	10 - 133
10:2 FTCA	6400	7060		ng/L		110	10 - 136
Perfluoro-2-methoxyacetic acid (PFMOAA)	6400	5340		ng/L		84	49 - 124
Perfluoro-n-hexadecanoic acid (PFHxDA)	6400	7620		ng/L		119	50 - 148

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-575681/2-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 575681

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorononanesulfonic acid (PFNS)	6160	6340		ng/L		103	57 - 139
EVE Acid	6400	5710		ng/L		89	58 - 135
8:2 FTUCA	6400	6450		ng/L		101	10 - 200
6:2 FTUCA	6400	5360		ng/L		84	10 - 200
10:2 FTUCA	6400	5610		ng/L		88	43 - 172
Perfluorotridecanoic acid (PFTrDA)	6400	6680		ng/L		104	57 - 140
Hydro-PS Acid	6400	5480		ng/L		86	48 - 127
Perfluorooctanesulfonamide (PFOSAm)	6400	6590		ng/L		103	38 - 132
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	5950	5700		ng/L		96	56 - 130
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	6000	6060		ng/L		101	62 - 126
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	5950	6040		ng/L		102	54 - 135
Hydro-EVE Acid	6400	5370		ng/L		84	60 - 137
Perfluorododecanesulfonic acid	6210	7900		ng/L		127	51 - 142
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)	6400	8360		ng/L		131	62 - 139
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	6400	8290		ng/L		130	10 - 162
Perfluoro-4-methoxybutanoic acid (PFMBA)	6400	6000		ng/L		94	41 - 127
3-Perfluoropentylpropanoic acid (5:3 FTCA)	6400	5860		ng/L		92	63 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	6050	5870		ng/L		97	56 - 130
MTP	6400	5800		ng/L		91	61 - 130

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
d5-NEtFOSAA	*99*		*34 - 178*
d3-NMeFOSAA	*92*		*38 - 162*
13C3 HFPO-DA	*84*		*41 - 163*
d7-N-MeFOSE-M	*81*		*36 - 165*
d9-N-EtFOSE-M	*83*		*44 - 158*
M2-6:2 FTS	*80*		*45 - 167*
M2-8:2 FTS	*78*		*58 - 158*
13C3 PFBS	*80*		*63 - 160*
M2-4:2 FTS	*78*		*46 - 166*
13C5 PFHxA	*79*		*50 - 156*
13C9 PFNA	*84*		*60 - 142*
13C6 PFDA	*79*		*64 - 141*
13C7 PFUnA	*84*		*27 - 168*
13C3 PFHxS	*75*		*57 - 159*
13C2-PFDoDA	*81*		*29 - 158*
d5-NEtPFOSA	*83*		*41 - 153*
d3-NMePFOSA	*77*		*36 - 151*
13C-6:2 FTCA	*62*		*10 - 200*

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-575681/2-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 575681

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-8:2 FTCA	65		10 - 200
13C-10:2 FTCA	72		10 - 200
13C-6:2 FTUCA	101		10 - 169
13C-8:2 FTUCA	97		10 - 164
13C-10:2 FTUCA	107		10 - 192
13C4 PFBA	79		67 - 136
13C5 PFPeA	75		63 - 139
13C4 PFHpA	82		60 - 150
13C8 PFOA	78		62 - 146
13C8 PFOS	84		64 - 141
13C8 FOSA	76		46 - 150
13C2 PFTeDA	77		33 - 150
13C3-PFPrA	77		50 - 150

Lab Sample ID: LCSD 410-575681/3-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 575681

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
NVHOS			6400	5720		ng/L		89	48 - 126	1	30
PES			5710	5210		ng/L		91	45 - 125	0	30
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)			6180	6710		ng/L		109	56 - 136	1	30
DNU			6400	4680		ng/L		73	50 - 131	12	30
Perfluoro-3-methoxypropanoic acid (PMPA)											
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			6400	5070		ng/L		79	41 - 137	11	30
PFECHS			5910	5470		ng/L		93	49 - 110	9	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)			6400	6000		ng/L		94	51 - 137	5	30
Perfluoro-n-octadecanoic acid (PFODA)			6400	5500		ng/L		86	49 - 148	14	30
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)			6400	6180		ng/L		97	53 - 149	3	30
Perfluorooctanesulfonic acid (PFOS)			5930	4970		ng/L		84	54 - 125	9	30
Perfluoroundecanoic acid (PFUnA)			6400	5350		ng/L		84	58 - 133	7	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)			6400	5090		ng/L		80	63 - 123	17	30
R-PSDA			6400	5450		ng/L		85	43 - 123	4	30
Hydrolyzed PSDA			6400	4760		ng/L		74	37 - 133	3	30
R-PSDCA			6400	4640		ng/L		73	47 - 129	0	30
R-EVE			6400	4840		ng/L		76	57 - 133	8	30
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)			6400	5630		ng/L		88	58 - 141	10	30
PEPA			6400	4250		ng/L		66	45 - 140	14	30
Perfluoropentanoic acid (PFPeA)			6400	5510		ng/L		86	53 - 150	10	30
Perfluoropentanesulfonic acid (PFPeS)			6020	5350		ng/L		89	54 - 140	1	30

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-575681/3-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 575681

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)			6090	5260		ng/L		86	63 - 142	10	30
8:2 FTCA			6400	6590		ng/L		103	10 - 135	9	30
PS Acid			6400	6230		ng/L		97	44 - 124	3	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)			6400	5650		ng/L		88	54 - 123	8	30
Perfluorohexanoic acid (PFHxA)			6400	5850		ng/L		91	52 - 133	8	30
Perfluorododecanoic acid (PFDoA)			6400	6700		ng/L		105	59 - 133	2	30
N-methylperfluorooctane sulfonamide (NMeFOSA)			6400	5670		ng/L		89	54 - 150	12	30
Perfluorooctanoic acid (PFOA)			6400	5740		ng/L		90	54 - 130	11	30
Perfluorodecanoic acid (PFDA)			6400	6340		ng/L		99	57 - 129	7	30
Perfluorodecanesulfonic acid (PFDS)			6170	5870		ng/L		95	51 - 146	8	30
Perfluorohexanesulfonic acid (PFHxS)			5840	5240		ng/L		90	51 - 129	10	30
3-Perfluoropropylpropanoic acid (3:3 FTCA)			6400	6410		ng/L		100	68 - 111	10	30
Perfluorobutanoic acid (PFBA)			6400	5850		ng/L		91	53 - 144	14	30
Perfluorobutanesulfonic acid (PFBS)			5660	5150		ng/L		91	44 - 131	1	30
Perfluoroheptanoic acid (PFHpA)			6400	5610		ng/L		88	59 - 135	14	30
Perfluoroheptanesulfonic acid (PFHpS)			6110	5600		ng/L		92	54 - 138	10	30
Perfluorononanoic acid (PFNA)			6400	5630		ng/L		88	54 - 137	8	30
Perfluorotetradecanoic acid (PFTeDA)			6400	5350		ng/L		84	56 - 137	26	30
Perfluoro-3-methoxypropanoic acid (PFMPA)			6400	5220		ng/L		82	70 - 121	14	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)			6140	6630		ng/L		108	55 - 144	5	30
Perfluoro(3,5-dioxahexanoic) acid (PFO2HxA)			6400	4530		ng/L		71	47 - 132	15	30
Perfluoro(3,5,7-trioxaoctanoic) acid (PFO3OA)			6400	5050		ng/L		79	51 - 133	9	30
Perfluoro(3,5,7,9-tetraoxadecanoic) acid (PFO4DA)			6400	4780		ng/L		75	50 - 139	11	30
Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid			6400	4770		ng/L		74	48 - 144	12	30
N-ethylperfluorooctane sulfonamide (NEtFOSA)			6400	6300		ng/L		98	62 - 135	8	30
Perfluoropropionic acid (PFPrA)			6400	5010		ng/L		78	67 - 116	7	30
Perfluoropropanesulfonic acid			5860	5050		ng/L		86	64 - 113	11	30
6:2 FTCA			6400	6100		ng/L		95	10 - 133	16	30
10:2 FTCA			6400	6650		ng/L		104	10 - 136	6	30
Perfluoro-2-methoxyacetic acid (PFMOAA)			6400	4480		ng/L		70	49 - 124	18	30
Perfluoro-n-hexadecanoic acid (PFHxDA)			6400	6280		ng/L		98	50 - 148	19	30
Perfluorononanesulfonic acid (PFNS)			6160	5440		ng/L		88	57 - 139	15	30
EVE Acid			6400	5040		ng/L		79	58 - 135	13	30
8:2 FTUCA			6400	5100		ng/L		80	10 - 200	23	30

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-575681/3-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 575681

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
6:2 FTUCA			6400	4990		ng/L		78	10 - 200	7	30
10:2 FTUCA			6400	5020		ng/L		78	43 - 172	11	30
Perfluorotridecanoic acid (PFTrDA)			6400	6270		ng/L		98	57 - 140	6	30
Hydro-PS Acid			6400	5520		ng/L		86	48 - 127	1	30
Perfluorooctanesulfonamide (PFOSAm)			6400	5470		ng/L		86	38 - 132	19	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)			5950	5000		ng/L		84	56 - 130	13	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)			6000	5270		ng/L		88	62 - 126	14	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)			5950	5490		ng/L		92	54 - 135	10	30
Hydro-EVE Acid			6400	4740		ng/L		74	60 - 137	13	30
Perfluorododecanesulfonic acid			6210	6810		ng/L		110	51 - 142	15	30
Perfluoro-4-isopropoxybutanoic acid (PFIpOBA)			6400	7330		ng/L		115	62 - 139	13	30
3-Perfluoroheptylpropanoic acid (7:3 FTCA)			6400	7140		ng/L		112	10 - 162	15	30
Perfluoro-4-methoxybutanoic acid (PFMBA)			6400	6380		ng/L		100	41 - 127	6	30
3-Perfluoropentylpropanoic acid (5:3 FTCA)			6400	5130		ng/L		80	63 - 130	13	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			6050	5460		ng/L		90	56 - 130	7	30
MTP			6400	5260		ng/L		82	61 - 130	10	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
d5-NEtFOSAA	*104*		*34 - 178*
d3-NMeFOSAA	*104*		*38 - 162*
13C3 HFPO-DA	*98*		*41 - 163*
d7-N-MeFOSE-M	*95*		*36 - 165*
d9-N-EtFOSE-M	*94*		*44 - 158*
M2-6:2 FTS	*87*		*45 - 167*
M2-8:2 FTS	*84*		*58 - 158*
13C3 PFBS	*84*		*63 - 160*
M2-4:2 FTS	*93*		*46 - 166*
13C5 PFHxA	*90*		*50 - 156*
13C9 PFNA	*94*		*60 - 142*
13C6 PFDA	*84*		*64 - 141*
13C7 PFUnA	*95*		*27 - 168*
13C3 PFHxS	*86*		*57 - 159*
13C2-PFDoDA	*88*		*29 - 158*
d5-NEtPFOSA	*94*		*41 - 153*
d3-NMePFOSA	*87*		*36 - 151*
13C-6:2 FTCA	*74*		*10 - 200*
13C-8:2 FTCA	*74*		*10 - 200*
13C-10:2 FTCA	*79*		*10 - 200*
13C-6:2 FTUCA	*113*		*10 - 169*

Method: EPA 537 (mod) - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCSD 410-575681/3-A
Matrix: Water
Analysis Batch: 576751

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 575681

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C-8:2 FTUCA	120		10 - 164
13C-10:2 FTUCA	116		10 - 192
13C4 PFBA	94		67 - 136
13C5 PFPeA	84		63 - 139
13C4 PFHpA	95		60 - 150
13C8 PFOA	88		62 - 146
13C8 PFOS	95		64 - 141
13C8 FOSA	88		46 - 150
13C2 PFTeDA	93		33 - 150
13C3-PFPrA	88		50 - 150

LCMS

Prep Batch: 575681

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-196590-4	PVA1-20, 75/60821-1	Total/NA	Water	537	
410-196590-5	PVB1-1, 1/60821-2	Total/NA	Water	537	
410-196590-6	PVC2-1, 1,5/60821-3	Total/NA	Water	537	
MB 410-575681/1-A	Method Blank	Total/NA	Water	537	
LCS 410-575681/2-A	Lab Control Sample	Total/NA	Water	537	
LCSD 410-575681/3-A	Lab Control Sample Dup	Total/NA	Water	537	

Analysis Batch: 576751

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-196590-4	PVA1-20, 75/60821-1	Total/NA	Water	EPA 537 (mod)	575681
410-196590-5	PVB1-1, 1/60821-2	Total/NA	Water	EPA 537 (mod)	575681
410-196590-6	PVC2-1, 1,5/60821-3	Total/NA	Water	EPA 537 (mod)	575681
MB 410-575681/1-A	Method Blank	Total/NA	Water	EPA 537 (mod)	575681
LCS 410-575681/2-A	Lab Control Sample	Total/NA	Water	EPA 537 (mod)	575681
LCSD 410-575681/3-A	Lab Control Sample Dup	Total/NA	Water	EPA 537 (mod)	575681

Prep Batch: 582115

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-196590-1	KA1-2, 1/58092-1	Total/NA	Solid	SHAKE	
410-196590-2	KA1-2 1,6/58092-3	Total/NA	Solid	SHAKE	
410-196590-3	KA1-2, 1,6/58092-4	Total/NA	Solid	SHAKE	
MB 410-582115/1-B	Method Blank	Total/NA	Solid	SHAKE	
LCS 410-582115/2-B	Lab Control Sample	Total/NA	Solid	SHAKE	
LCSD 410-582115/3-B	Lab Control Sample Dup	Total/NA	Solid	SHAKE	

Cleanup Batch: 582742

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-196590-1	KA1-2, 1/58092-1	Total/NA	Solid	Extract Aliquot	582115
410-196590-2	KA1-2 1,6/58092-3	Total/NA	Solid	Extract Aliquot	582115
410-196590-3	KA1-2, 1,6/58092-4	Total/NA	Solid	Extract Aliquot	582115
MB 410-582115/1-B	Method Blank	Total/NA	Solid	Extract Aliquot	582115
LCS 410-582115/2-B	Lab Control Sample	Total/NA	Solid	Extract Aliquot	582115
LCSD 410-582115/3-B	Lab Control Sample Dup	Total/NA	Solid	Extract Aliquot	582115

Analysis Batch: 583606

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-196590-1	KA1-2, 1/58092-1	Total/NA	Solid	537 IDA	582742
410-196590-2	KA1-2 1,6/58092-3	Total/NA	Solid	537 IDA	582742
410-196590-3	KA1-2, 1,6/58092-4	Total/NA	Solid	537 IDA	582742
MB 410-582115/1-B	Method Blank	Total/NA	Solid	537 IDA	582742
LCS 410-582115/2-B	Lab Control Sample	Total/NA	Solid	537 IDA	582742
LCSD 410-582115/3-B	Lab Control Sample Dup	Total/NA	Solid	537 IDA	582742

Prep Batch: 584381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-196590-3 - RE	KA1-2, 1,6/58092-4	Total/NA	Solid	SHAKE	
MB 410-584381/1-B	Method Blank	Total/NA	Solid	SHAKE	
LCS 410-584381/2-B	Lab Control Sample	Total/NA	Solid	SHAKE	
LCSD 410-584381/3-B	Lab Control Sample Dup	Total/NA	Solid	SHAKE	

QC Association Summary

Client: Eurofins VBM Laboratoriet A/S
Project/Site: AAUe udvaskningsprojekt

Job ID: 410-196590-1

LCMS

Cleanup Batch: 584934

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-196590-3 - RE	KA1-2, 1,6/58092-4	Total/NA	Solid	Extract Aliquot	584381
MB 410-584381/1-B	Method Blank	Total/NA	Solid	Extract Aliquot	584381
LCS 410-584381/2-B	Lab Control Sample	Total/NA	Solid	Extract Aliquot	584381
LCSD 410-584381/3-B	Lab Control Sample Dup	Total/NA	Solid	Extract Aliquot	584381

Analysis Batch: 585207

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-196590-3 - RE	KA1-2, 1,6/58092-4	Total/NA	Solid	537 IDA	584934
MB 410-584381/1-B	Method Blank	Total/NA	Solid	537 IDA	584934
LCS 410-584381/2-B	Lab Control Sample	Total/NA	Solid	537 IDA	584934
LCSD 410-584381/3-B	Lab Control Sample Dup	Total/NA	Solid	537 IDA	584934

General Chemistry

Analysis Batch: 575499

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-196590-1	KA1-2, 1/58092-1	Total/NA	Solid	Moisture	
410-196590-2	KA1-2 1,6/58092-3	Total/NA	Solid	Moisture	
410-196590-3	KA1-2, 1,6/58092-4	Total/NA	Solid	Moisture	

Lab Chronicle

Client: Eurofins VBM Laboratoriet A/S
Project/Site: AAUe udvaskningsprojekt

Job ID: 410-196590-1

Client Sample ID: KA1-2, 1/58092-1
Lab Sample ID: 410-196590-1
Date Collected: 10/21/24 00:00
Matrix: Solid
Date Received: 11/14/24 12:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	575499	UVJN	ELLE	11/15/24 09:08

Client Sample ID: KA1-2, 1/58092-1
Lab Sample ID: 410-196590-1
Date Collected: 10/21/24 00:00
Matrix: Solid
Date Received: 11/14/24 12:00
Percent Solids: 87.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	SHAKE			582115	D8NM	ELLE	12/04/24 15:43
Total/NA	Cleanup	Extract Aliquot			582742	D8NM	ELLE	12/05/24 20:21
Total/NA	Analysis	537 IDA		1	583606	R7RE	ELLE	12/09/24 11:28

Client Sample ID: KA1-2 1,6/58092-3
Lab Sample ID: 410-196590-2
Date Collected: 10/21/24 00:00
Matrix: Solid
Date Received: 11/14/24 12:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	575499	UVJN	ELLE	11/15/24 09:08

Client Sample ID: KA1-2 1,6/58092-3
Lab Sample ID: 410-196590-2
Date Collected: 10/21/24 00:00
Matrix: Solid
Date Received: 11/14/24 12:00
Percent Solids: 91.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	SHAKE			582115	D8NM	ELLE	12/04/24 15:43
Total/NA	Cleanup	Extract Aliquot			582742	D8NM	ELLE	12/05/24 20:21
Total/NA	Analysis	537 IDA		1	583606	R7RE	ELLE	12/09/24 11:41

Client Sample ID: KA1-2, 1,6/58092-4
Lab Sample ID: 410-196590-3
Date Collected: 10/21/24 00:00
Matrix: Solid
Date Received: 11/14/24 12:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	575499	UVJN	ELLE	11/15/24 09:08

Client Sample ID: KA1-2, 1,6/58092-4
Lab Sample ID: 410-196590-3
Date Collected: 10/21/24 00:00
Matrix: Solid
Date Received: 11/14/24 12:00
Percent Solids: 96.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	SHAKE	RE		584381	D8NM	ELLE	12/10/24 16:09
Total/NA	Cleanup	Extract Aliquot	RE		584934	WHU6	ELLE	12/11/24 15:33
Total/NA	Analysis	537 IDA	RE	1	585207	R7RE	ELLE	12/12/24 12:34
Total/NA	Prep	SHAKE			582115	D8NM	ELLE	12/04/24 15:43
Total/NA	Cleanup	Extract Aliquot			582742	D8NM	ELLE	12/05/24 20:21
Total/NA	Analysis	537 IDA		1	583606	R7RE	ELLE	12/09/24 11:55

Lab Chronicle

Client: Eurofins VBM Laboratoriet A/S
Project/Site: AAUe udvaskningsprojekt

Job ID: 410-196590-1

Client Sample ID: PVA1-20, 75/60821-1

Lab Sample ID: 410-196590-4

Date Collected: 10/21/24 00:00
Matrix: Water
Date Received: 11/14/24 12:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	537			575681	YJK4	ELLE	11/15/24 14:04
Total/NA	Analysis	EPA 537 (mod)		1	576751	MC7V	ELLE	11/18/24 18:35

Client Sample ID: PVB1-1, 1/60821-2

Lab Sample ID: 410-196590-5

Date Collected: 10/21/24 00:00
Matrix: Water
Date Received: 11/14/24 12:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	537			575681	YJK4	ELLE	11/15/24 14:04
Total/NA	Analysis	EPA 537 (mod)		1	576751	MC7V	ELLE	11/18/24 18:48

Client Sample ID: PVC2-1, 1,5/60821-3

Lab Sample ID: 410-196590-6

Date Collected: 10/21/24 00:00
Matrix: Water
Date Received: 11/14/24 12:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	537			575681	YJK4	ELLE	11/15/24 14:05
Total/NA	Analysis	EPA 537 (mod)		1	576751	MC7V	ELLE	11/18/24 19:02

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Eurofins VBM Laboratoriet A/S
Job ID: 410-196590-1
Project/Site: AAUe udvaskningsprojekt

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-26
A2LA	Dept. of Energy	0001.01	11-30-26
A2LA	ISO/IEC 17025	0001.01	11-30-26
Alabama	State	43200	01-31-25
Alaska	State	PA00009	06-30-25
Alaska (UST)	State	17-027	02-28-25
Arizona	State	AZ0780	03-12-25
Arkansas DEQ	State	88-00660	08-09-25
Colorado	State	PA00009	06-30-25
Connecticut	State	PH-0746	06-30-25
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-25
Delaware (DW)	State	N/A	01-31-25
Florida	NELAP	E87997	06-30-25
Georgia (DW)	State	C048	01-31-25
Hawaii	State	N/A	01-31-25
Illinois	NELAP	200027	01-31-25
Iowa	State	361	03-01-26
Kansas	NELAP	E-10151	10-31-25
Kentucky (DW)	State	KY90088	12-31-24
Kentucky (UST)	State	0001.01	11-30-26
Kentucky (WW)	State	KY90088	12-31-24
Louisiana (All)	NELAP	02055	06-30-25
Maine	State	2019012	03-12-25
Maryland	State	100	06-30-25
Massachusetts	State	M-PA009	06-30-25
Michigan	State	9930	01-31-25
Minnesota	NELAP	042-999-487	12-31-25
Mississippi	State	023	01-31-25
Missouri	State	450	01-31-25
Montana (DW)	State	0098	12-31-24
Nebraska	State	NE-OS-32-17	01-31-25
New Hampshire	NELAP	2730	01-10-25
New Jersey	NELAP	PA011	06-30-25
New York	NELAP	10670	04-01-25
North Carolina (DW)	State	42705	07-31-25
North Carolina (WW/SW)	State	521	12-31-25
North Dakota	State	R-205	01-31-24 *
Oklahoma	NELAP	9804	08-31-24 *
Oregon	NELAP	PA200001	09-11-25
Pennsylvania	NELAP	36-00037	01-31-26
Quebec Ministry of Environment and Fight against Climate Change	PALA	507	09-16-29
Rhode Island	State	LAO00338	12-30-24
South Carolina	State	89002	01-31-25
Tennessee	State	02838	01-31-25
Texas	NELAP	T104704194-23-46	08-31-25
USDA	US Federal Programs	525-22-298-19481	10-25-25
Vermont	State	VT - 36037	10-28-25
Virginia	NELAP	460182	06-14-25
Washington	State	C457	04-11-25

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Eurofins VBM Laboratoriet A/S
Job ID: 410-196590-1
Project/Site: AAUe udvaskningsprojekt

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
West Virginia (DW)	State	9906 C	01-31-25
West Virginia DEP	State	055	07-31-25
Wyoming	State	8TMS-L	01-31-25
Wyoming (UST)	A2LA	0001.01	11-30-26

Method Summary

Client: Eurofins VBM Laboratoriet A/S
Project/Site: AAUe udvaskningsprojekt

Job ID: 410-196590-1

Method	Method Description	Protocol	Laboratory
537 IDA	EPA 537 Isotope Dilution	EPA	ELLE
EPA 537 (mod)	EPA 537 Isotope DIlution	EPA	ELLE
Moisture	Percent Moisture	EPA	ELLE
537	537 Isotope Dilution	EPA	ELLE
Extract Aliquot	Preparation, Extract Aliquot	None	ELLE
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Eurofins VBM Laboratoriet A/S
Project/Site: AAUe udvaskningsprojekt

Job ID: 410-196590-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-196590-1	KA1-2, 1/58092-1	Solid	10/21/24 00:00	11/14/24 12:00
410-196590-2	KA1-2 1,6/58092-3	Solid	10/21/24 00:00	11/14/24 12:00
410-196590-3	KA1-2, 1,6/58092-4	Solid	10/21/24 00:00	11/14/24 12:00
410-196590-4	PVA1-20, 75/60821-1	Water	10/21/24 00:00	11/14/24 12:00
410-196590-5	PVB1-1, 1/60821-2	Water	10/21/24 00:00	11/14/24 12:00
410-196590-6	PVC2-1, 1,5/60821-3	Water	10/21/24 00:00	11/14/24 12:00

Eurofins Lancaster Laboratories Env, LLC
2425 New Holland Pike
Lancaster, PA 17601
Phone (717) 656-2300

Chain o

410-196590-01 Chain of Custody

eurofins | Environment Testing America

Client Information	Sampler: Eurofins VBM	Phone: _+45 98 21 32 00	Carrier Tracking No(s):	COC No:
Client Contact: Hans-Christian Greve, yvd5@etn eurofins com			State of Origin: Denmark	Page:
Company: Eurofins Environment Denmark, Eurofins VBM	PWSID:		Analysis Requested	Job #:
Address: Industrivej 1	Due Date Requested: 15-11-2024			Preservation Codes: A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
City: Aabybro	TAT Requested (days): Earlies possible (5 workdays?)			
State, Zip: 9440	Compliance Project: Δ Yes Δ No			
Phone: _+45 98 21 32 00 or +45 26 86 36 91	PO #:			Other:
Email: sh-resultaterVBM@ETN eurofins com	WO #:			
Project Name: AAUe udvaskningsprojekt	Project #:			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFAS 70 package	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
KA1-2, 1 / 58092-1	10-21-24			S	no		x		Att Dana Kauffman. Expanded PFAS package on 70 compounds.
KB1-2 1,6 / 58092-3	10-21-24			S	no		x		Att Dana Kauffman. Expanded PFAS package on 70 compounds.
KC2-2, 1,6 / 58092-4	10-21-24			S	no		x		Att Dana Kauffman. Expanded PFAS package on 70 compounds.
PVA1-1,0,75 / 60821-1	10-21-24			W	yes		x		Att Dana Kauffman. Expanded PFAS package on 70 compounds.
PVB-1,1 / 60821-2	10-21-24			W	yes		x		Att Dana Kauffman. Expanded PFAS package on 70 compounds.
PVC2-1, 1,5 / 60821-3	10-21-24			W	yes		x		Att Dana Kauffman. Expanded PFAS package on 70 compounds.

Possible Hazard Identification: Risk of high PFAS content
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☒ Archive For 1 Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

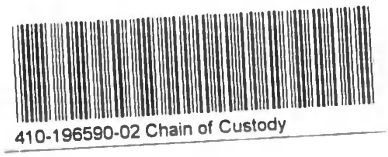
Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 11/19/24 1200	Company ECET

Custody Seals Intact: Δ Yes Δ No	Custody Seal No:	Cooler Temperature(s) °C and Other Remarks: R: 16.0 C: 15.9

Ver: 01/16/2019

USDA United States Department of Agriculture



United States Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection & Quarantine
4700 River Road
Riverdale, MD 20737

Permit to Receive Soil Regulated by 7 CFR 330

APPLICATION NUMBER:	A-00155948	**DATE ISSUED:**	10/25/2022
PERMIT NUMBER:	525-22-298-19481	**EFFECTIVE:**	**10/25/2022 – 10/25/2025**

APPLICANT NAME:	Mr. Kenneth Boley	**PERMITTEE NAME:**	Mr. Kenneth Boley
ORGANIZATION:	Eurofins Lancaster Laboratories Environment Testing, LLC	**ORGANIZATION:**	Eurofins Lancaster Laboratories Environment Testing, LLC
ADDRESS:	2425 New Holland Pike, Lancaster, Pennsylvania, 17601	**ADDRESS:**	2425 New Holland Pike, Lancaster, Pennsylvania, 17601
MAILING ADDRESS:	2425 New Holland Pike, Lancaster, Pennsylvania, 17601	**MAILING ADDRESS:**	2425 New Holland Pike, Lancaster, Pennsylvania, 17601
PHONE:	7175569413	**PHONE:**	7175569413
ALTERNATE PHONE:	7176562300	**ALTERNATE PHONE:**	7176562300
EMAIL:	kenneth.boley@et.eurofinsus.com	**EMAIL:**	kenneth.boley@et.eurofinsus.com
ALTERNATE EMAIL:		**ALTERNATE EMAIL:**	

APPROVED FOR HAND CARRY: No

PORTS OF ARRIVAL/PLANT INSPECTION STATIONS: Various Approved Ports of Entry Specified in Conditions & Staffed by CBP, ;

Destination Location

Name: Eurofins Lancaster Laboratories Environment Testing, LLC
Facility Number: PPQ-PA-261466
Type: Laboratory
Address: 2425 New Holland Pike
City, State, ZIP Code: Lancaster, PA 17601
County:
Latitude and Longitude: 0, 0
Growing Location Description:

Primary Contact
Name: Kenneth Boley
Email: kenneth.boley@et.eurofinsus.com
Alternate Email:
Phone: 7175569413
Alternate Phone:

Intended Use: Chemical or physical analysis
Are you importing 3 lbs (1.39 kg) or more of soil, excluding packaging? Yes

Permit Number: 525-22-298-1948

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EFILE **APHIS eFile Automatic Issued Permit Regulated by 7 CFR 330**	DATE 10/25/2022

WARNING: Any alteration, forgery or unauthorized use of this Federal Form is subject to civil penalties of up to $250,000 (7 U.S.C.s 7734(b)) or punishable by a fine of not more than $10,000, or imprisonment of not more than 5 years, or both (18 U.S.C.s 1001)

USDA United States Department of Agriculture

Can a Plant Inspection Station sterilize the soil in its packaging at 250°F (121°C) by dry or steam heat?
Mode(s) of Transport Air freight;Air mail;Express delivery;Land freight;Maritime freight

Under the conditions specified, this permit authorizes the following:

Movement Type: Import

Shipments

1. Various Countries

SPECIAL INSTRUCTIONS TO INSPECTORS

INSTRUCTIONS TO DHS CBP INSPECTORS FOR IMPORTED SOIL SHIPMENTS ROUTED TO RECEIVING FACILITY:
For hand carry of soil, an official of CBP Agricultural Programs and Trade Liaison (APTL) would have been notified to document and facilitate the entry of the soil (See hand carry conditions below if stipulated).

Otherwise:
1) Confirm that the shipment under this USDA PPQ P330 permit is under bond to the point of entry.
2) Validate the permit in CBP's ACE/DIS system.
3) Confirm that the imported shipment has a valid USDA PPQ Form 550 Black/White label.
4) For questions or concerns, contact the USDA-APHIS-PPQ Permit Unit in Riverdale, MD, at 866-524-5421 and ask to speak with a compliance officer.

See permit conditions below

PERMIT GUIDANCE

1) Receipt or use of foreign isolates or samples from countries under sanctions requires specific permission from the U.S. Department of Treasury; please refer to https://www.treasury.gov/resource-center/sanctions/Programs/Pages/Programs.aspx
2) This permit does not authorize importation, interstate movement, possession, and/or use of strains of genetically engineered regulated materials/organisms (created by the use of recombinant DNA technology).
3) If an animal pathogen is identified in your shipment, to ensure appropriate safeguarding, please refer to http://www.aphis.usda.gov/import_export/animals/animal_import/animal_imports_anproducts.shtml
4) If a human pathogen is identified, please refer to the CDC Etiologic Agent Import Permit Program at http://www.cdc.gov/od/eaipp/
5) This permit does not fulfill the requirements of other federal or state regulatory authorities. Please contact the appropriate agencies, such as the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the U.S. Food and Drug Administration, the Centers for Disease Control and Prevention, the APHIS Veterinary Services unit, the APHIS Biotechnology Regulatory Services, or your State's Department of Agriculture to ensure proper permitting.

Permit Number: 525-22-298-1948

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EFILE	DATE
APHIS eFile Automatic Issued Permit Regulated by 7 CFR 330	10/25/2022

USDA United States Department of Agriculture

6) If you are considering renewal of this permit, an application should be submitted at least 90 days prior to the expiration date of this permit to ensure continued coverage. Permits requiring containment facilities may take a longer period of time to process.

PERMIT CONDITIONS

USDA-APHIS issues this permit to Kenneth Boley with Eurofins Lancaster Laboratories Environment Testing, LLC in Lancaster, Pennsylvania. The permit authorizes the importation of soil from all foreign sources (except countries with sanctions or embargoes by U.S. State Department) only for chemical/physical analysis in a controlled laboratory environment at the named facility on the permit.

1. This permit is issued by the United States Department of Agriculture's Animal and Plant Health Inspection Service (APHIS). It conveys APHIS regulations and requirements for the material(s) listed on this permit. It does not reduce or eliminate your legal duty and responsibility to comply with all other applicable Federal and State regulatory requirements. • A copy of the permit or the permit number must accompany the shipment. • You must be an individual at least 18 years old, or legal entity such as partnership, corporation, association, or joint venture. • You are legally responsible for complying with all permit requirements and permitconditions. • The regulated material and shipping container(s) are subject to inspection by officials of U.S. Customs and Border Protection (CBP) and APHIS. CBP or APHIS officials mayrequire the shipment to be treated, seized, re-exported, or destroyed (in part or whole).You will be responsible for any associated expenses. • If you violate any applicable laws associated with this permit, you may face substantial civil or criminal penalties. We may cancel all current permits and deny future permitapplications. • Without prior notice and during reasonable hours, authorized Federal and StateRegulators must be allowed to inspect the conditions associated with the regulatedmaterials/organisms authorized under this permit.
2. The Permit holder must comply with all the items listed below. In cases where notification is required, the notification must be made to the PPQ Pest Permit Staff at 866-524-5421or pest.permits@usda.gov within one business day of the event triggering a notification. You must also notify the PPQ State Plant Health Director (SPHD) in your State. Access the list of SPHDs at https://www.aphis.usda.gov/aphis/ourfocus/planthealth/ppq-program-overview/ct_sphd. • maintain a valid PPQ 330 permit as long as any portion of the regulated soil has not been treated or disposed of in accordance with these permit conditions, • maintain an official permanent work assignment or affiliation at the address on this permit, • notify PPQ of any change in the permit holder's work assignment, place of business, or affiliation, • not assign or transfer this permit to other persons without prior PPQ authorization, • notify PPQ of the receipt of an unauthorized and/or misdirected shipment of regulated soil and hold it until further instruction from PPQ, • notify PPQ if the shipment includes any unusual/unexpected contents (including live insects and snails) and take all prudent measures to contain them until further instruction from PPQ, • notify PPQ of any unauthorized or accidental release of the regulated soil and adequately mitigate the resulting environmental impacts, • notify PPQ if the facility or equipment is damaged, destroyed, or otherwise compromised, • notify PPQ if you intend to let your permit expire and you will no longer receive, handle, and/or dispose of regulated soil.

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EFILE	DATE
APHIS eFile Automatic Issued Permit Regulated by 7 CFR 330	10/25/2022

3. Prohibitions/Limitations: Regulated soil must not be used: • in field research or for other release into the environment before sterilization, • for isolating, culturing, extracting, or concentrating live organisms, • as a growing medium, unless specifically authorized in this permit.
4. Shipping/Movement 1) All packages for transport must minimally consist of inner/primary and outer/secondary package, both in a securely sealed tertiary container so that all are effective barriers to prevent escape or unauthorized dissemination of the listed regulated materials. The inner/primary package will contain all regulated materials and must be cushioned and sealed inside a secondary container in such a way that both remain sealed during shock, impact, and pressure changes that may occur. The outermost/tertiary shipping container must be rigid, strong enough, and sealed to withstand typical shipping conditions(dropping, stacking, impact from other freight, etc.) without opening. 2) For soil that originates in Hawaii and Puerto Rico, a copy of this permit or permit number and the shipment must be presented to APHIS-Plant Protection and Quarantine(PPQ) for inspection and clearance prior to departure. For soil that originates in the U.S. Virgin Islands, a copy of this permit or the permit number and the shipment must be presented to APHIS-PPQ in Puerto Rico for inspection and clearance prior to arrival in mainland U.S. For more information on how to ship your package to APHIS-PPQ in Puerto Rico, please visit our website at:https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/permits/plant-pests/sa_soil/soil-shipping-requirements. Following inspection, soil shipments from Hawaii, Puerto Rico, and the U.S. Virgin Islands are authorized to enter at any arrival point on the mainland U.S. 3) Unless the regulated soil is hand carried by an individual specifically authorized in this permit, it must be shipped by bonded carrier to the port of entry. Following release by CBP, further movement to the APHIS-PPQ approved facility must occur by means of a generally recognized commercial carrier. 4) The shipment must be free from foreign matter or debris, plants and plant parts, and other macro-organisms, such as insects, cyst nematodes, mollusks and acari. Regulated material commingled with unauthorized material will be treated, seized, re-exported, or destroyed (in part or whole). 5) All solid wood packing material (SWPM) accompanying the shipment must be incompliance with ISPM 15 treatment regulations and IPPC stamp requirements and enforcement. Noncompliant shipments will be treated, re-exported or destroyed at the consignee's expense. 6) Further distribution or movement of the regulated soil is not allowed without prior approval from the APHIS-PPQ SPHD in your State. Access the list of SPHDs athttps://www.aphis.usda.gov/aphis/ourfocus/planthealth/ppq-program-overview/sphd. For such movements, you must follow the packaging standards described in these permit conditions, except that the use of black and white labels is not required. 7) Certain domestic mainland soil is regulated separately under 7 CFR 301. This permit does NOT authorize the movement of such soil. For further information on the movement of domestic mainland soil visit:https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/permits/regulated - organism-and-soil-permits/sa_soil/ct_domestic_soil.
5. HAND CARRY AUTHORIZATION The following conditions apply to all authorized hand carry events. Note: NO PPQ-issuedP550 shipping labels are required for hand carry events. a) At least 20 days prior to each hand carry event, the permit holder or designee must notify the PPQ Permit Compliance Officer by email atPPQSoilHandCarryRequest@usda.gov. In the subject line of the email, write "Notification of Hand Carry - Permit # xxxx": The email must contain the following information: i. hand carrier's name and permit number ii. anticipated first port of entry into the United States iii. description of the regulated material/organism and detailed description of the packaging

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EFILE	DATE
APHIS eFile Automatic Issued Permit Regulated by 7 CFR 330	10/25/2022

method used for transport of the specimens (e.g. vials with cork lids wrapped in bubble wrap, in ziploc bags, packed in a hard sided hand carry cooler sealed with duct tape). v. date and time of arrival and method of transport (maritime, land border, air) and travel plans from the first port of arrival to the final destination Note: detailed description of the transport method (e.g. airline and flight number, flight arrival time; or for land border crossing, vehicle make/model/tag number with three- hour window arrival time) will facilitate Customs and Border Protection's inspection at the port of entry. The PPQ Permit Compliance Officer will notify the Customs and Border Protection (CBP)Agricultural Specialist at the port of entry to document and facilitate the entry of the regulated material/organism. b) If you have domestic (connecting) air travel plans, please contact the Transportation Security Administration (TSA) prior to arrival into the U.S.: TSA Contact Center Telephone: 1-866-289-9673; Email: TSA-ContactCenter@tsa.dhs.gov. Passengers can request special assistance with the screening process via the TSA Contact Center. Although special handling may be requested when traveling with fragile or sensitive items, TSA must conduct sufficient screening to ensure all property does not present a security threat. For more information visit www. TSA.gov. c) Only the person(s) whose name(s) is/are listed on the issued permit is/are authorized to hand-carry and the hand carrier must ensure the following: i. All materials/organisms must be packaged as described in the permit conditions. ii. Packaging material must be free of insects, noxious weeds, and other plants pests and must be treated as described in the permit conditions before discarded or reused. iii. Hand-carried regulated materials/organisms must fit in the plane's overhead bin or under the seat. Hand-carried materials/organisms are not to be checked as baggage/luggage, and must remain on or in close proximity to one's person.

6. Shipping Labels/Labeling After issuance of this P330 permit and prior to importation, you will need to request PPQForm 550 Black/White shipping label(s) at least 5 business days in advance of shippingdate. If you applied online using eFile, you may request the labels using the MyShipments/Labels feature. Otherwise, send your request toBlackWhiteGreenYellowlabelrequest@usda.gov. Specify the permit number and the totalnumber of labels needed. All email requests must come from the permit holder orappointee and if requested by the appointee, they must Cc the permit holder on allrequests. You may request additional labels the same way. We will send you the labels byemail as a pdf. A label must be attached with clear tape to the exterior of each package being importedunder this permit. (It is NOT necessary to provide a shipping label for every samplecontained within one package e.g. 5 bottles/bags/vials within one box needs only ONElabel, not five). The labels have detailed instructions for use on the reverse side. You areresponsible for instructing your shipper to carefully follow these instructions. You areresponsible for each import shipping label issued under this permit. Failure to do so mayresult in refused entry or destruction of your package. Enclose the following supplemental information in each shipment: - Permittee Name - Permit number - Label number Underlying packaging/wrapping must carry the address, billing, and any other informationrequired to direct the shipment to its final destination (i.e., the permit holder's address;N.B., USDA APHIS does not defray any additional shipping costs incurred for transitingthe shipment through an inspection station as the initial US destination). NOTE: the PPQ Form 550 Black/White label is NOT required on shipments of soil thatoriginate in Hawaii, Puerto Rico, and the U.S. Virgin Islands.
7. d) The hand carrier must declare the regulated material/organism at the port of entry. The hand carrier must present acceptable personal identification documents to CBP upon request. The hand carrier

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EFILE	DATE
APHIS eFile Automatic Issued Permit Regulated by 7 CFR 330	10/25/2022

must also present a copy and/or permit number of the valid PPQ Permit that authorizes the hand carry. e) In the event that a problem is detected, CBP may seize and destroy the package or send it to the nearest PPQ Plant Inspection Station for further processing. The permitholder is responsible for all costs incidental to such actions. f) The authorization to hand carry is only for the regulated material/organism identified in the permit. The presence of unauthorized regulated materials/organisms is a permit violation. g) After CBP confirmation and clearance through the first port of entry into the U.S., the hand carrier will not open or modify the package (including removal of anything applied to the package by CBP or another Federal Agency) until it arrives at the authorized facility. The hand carried regulated material/organism must be transported directly to the containment facility authorized in the permit. In the event that circumstances beyond the carrier's control cause a significant deviation in transport, the carrier must contact the PPQ Permit Compliance Officer at 866-524-5421 (pests/pathogens, federal noxious weeds/parasitic plants, soil, and host plant materials) or 877-770-5990 (for restricted or prohibited plant material). h) Within 24 hours of the first business day of the regulated material/organisms' arrival at the facility, an independent third party (e.g. containment facility director, departmental chair, campus biosafety officer, etc.) must notify the PPQ Permit Compliance Officer via email at: BlackWhiteGreenYellowlabelrequest@usda.gov that the shipment remained sealed until arrival. The notification must include what regulated material/organism was imported, its origin, permit number, date of arrival, and quantity. In the subject line of the email, please write: "Notification of Hand Carry Arrival - Permit # xxxx". See 29(a) above for the list of e-mail addresses to use for the notification. i) Failure to notify the PPQ Permit Compliance Officer may result in loss of hand carry privileges. A PPQ inspector may visit the facility to confirm the arrival of the package and its contents.

8. Facility (Storage/Handling) 1) All regulated soil must be safeguarded at all times during movement, handling, and storage, until sterilized by one of the treatment method(s) specified in this permit. Upon arrival at the APHIS-PPQ approved facility, the regulated soil must be stored in two levels of secured containment until transferred or sterilized. As long as regulated soil is present, the containment and all other affected areas of the facility must be restricted to access by authorized personnel only. 2) All containers and storage areas will be labeled: “Regulated Soil – Sterilize before Disposal” (or an acceptable equivalent). The secured containment area must store only regulated material or, if the area also houses unregulated material, the regulated material must be clearly segregated from the unregulated material as well as being appropriately labeled. 3) The permit holder is responsible for the activities of those individuals working with the regulated soil. Everyone handling the regulated soil must read, agree to, and initial the permit conditions before working with or handling the regulated material. These initialed conditions do not need to be submitted to APHIS-PPQ but must be readily accessible in the event of an inspection and presented upon request. 4) Modifications to the facility or any procedural changes that affect the handling of the regulated soil must be approved by APHIS-PPQ prior to making changes. Please contact the PPQ Pest Permit Staff (email: pest.permits@usda.gov; phone: 866-524-5421;address: 4700 River Road, Unit 133, Riverdale, MD 20737; fax: 301-734-8700).
9. Treatment/Disposal All decontamination, sterilization, and disposal must comply with one of the methods authorized by the permit conditions. Prior to disposal, all regulated soil must be sterilized by one of the following methods: Autoclave a. Autoclave at 121 Celsius (250 Fahrenheit) for a minimum of 30 minutes at 15 psi. b. Place autoclave tape or other indicators on each load prior to treatment.

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EFILE	DATE
APHIS eFile Automatic Issued Permit Regulated by 7 CFR 330	10/25/2022

Check the autoclave tape or other indicator on each container to verify color change before disposal. c. Calibrate annually according to the manufacturer's instructions and maintain written records. d. Use a commercially available biological indicator kit every 3 months, containing bacterial spores (e.g. Geobacillus stearothermophilus species) that are rendered unviable at 121 Celsius (250 Fahrenheit). Follow the manufacturer's instructions. Service and retest the autoclave if any growth is observed. Dry Heat Use one of the following minimum temperature ranges and minimum exposure time combinations: 110 – 120.5 Celsius (230 – 249 Fahrenheit) for 16 hours 121 – 154 Celsius (250 – 309 Fahrenheit) for 2 hours 154.4 – 192.5 Celsius (310 – 379 Fahrenheit) for 30 minutes 193 – 220 Celsius (380 – 429 Fahrenheit) for 4 minutes 221 – 232 Celsius (430 – 450 Fahrenheit) for 2 minutes NOTE: Time starts when the entire sample reaches the required temperature and you must utilize a suitable temperature probe or currently calibrated thermometer for verification. The soil must be spread evenly throughout the chamber and not exceed 6inches in depth. Hydroclave a. Hydroclave at a minimum of 121 Celsius (250 Fahrenheit) for a minimum of 30 minutes, or at a minimum of 132 Celsius (267 Fahrenheit) for a minimum of 15 minutes. b. Observe the temperature sensor to ensure that the hydroclave maintains its required temperature. c. Calibrate the hydroclave annually according to the manufacturer's instructions and maintain written records. Incineration With the exception of metal and glass containers, all regulated and associated material must be reduced completely to ash at the end of the incineration cycle. As an alternative to the sterilization requirements listed above, disposal of regulated soil and any material contaminated with regulated soil may be conducted off site by a Disposal Facility holding a current PPQ Permit for Bulk Disposal or a Compliance Agreement for Bulk Disposal. Vendor may or may not be in the same state. SPHD approval is required prior to any movement of the regulated soil and approval is required in both the sending state and receiving state. Access the list of SPHDs athttps://www.aphis.usda.gov/aphis/ourfocus/planthealth/ppq-program-overview/ct_sphd. All regulated soil and any material contaminated with regulated soil must be double contained during transport to the Disposal Facility to prevent any unauthorized dissemination of the regulated soil. For records maintenance requirements, refer to the record keeping permit condition. No other sterilization methods are allowed without prior review and approval from PPQ Pest Permit Unit Staff.

10 Decontamination of surfaces, tools, equipment, supplies and related materials 1) Unless other disposal arrangements have been approved in advance by PPQ Pest Permit Staff, all items coming in direct contact with, or exposed to, the regulated soil --including but not limited to glassware, countertops, equipment, waste material, effluent ,and shipping materials -- must be sterilized/sanitized/decontaminated prior to re-use or removal from the APHIS-PPQ approved facility, and prior to the expiration of this permit. 2) Use any of the following, either alone or in combination: a) immersed in minimum of .525 percent sodium hypochlorite (household bleach from the bottle is a minimum of 5 percent) for at least 20 minutes b) immersed in 70 percent alcohol or ethanol for at least 30 minutes, c) treated with quaternary ammonium compounds per manufacturer's specifications, d) using one of the soil sterilization methods above. 3) Hydroclave or autoclave effluent as stipulated above.

11 Training requirements/Records/Record-Keeping 1) Standard Operating Procedures (SOPs) must be filed with, and approved by, the PPQ Pest Permit Staff at: email: pest.permits@usda.gov; phone: 866-524-5421; fax: 301-734-8700; address: River Road, Unit 133, Riverdale, MD 20737. All contact information must be kept current and the SOPs must be dated. If requirements in the permit conditions

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EFILE	DATE
APHIS eFile Automatic Issued Permit Regulated by 7 CFR 330	10/25/2022

are more restrictive than the SOPs, the permit conditions take precedence. APHIS-PPQ must approve any changes to the SOPs before implementation. At a minimum, the SOP should describe how you will maintain compliance with APHIS-PPQ regulations. It must include how you plan to: transport, handle/process, store, safeguard, treat, and dispose of the regulated soil, effluent, and anything else coming into contact with the regulated soil. The SOP must also contain instructions regarding the cleanup of potential spillage of regulated soil and must be posted in areas where soil is stored and processed. A current copy of the SOP must be available at the time of facility inspection. 2) All employees working with the regulated soil must complete annual training. The training must cover the requirements on this permit and the Standard Operating Procedures submitted to APHIS-PPQ. Both a copy of the permit and the SOPs must be available at all times for the facility staff to consult. Training records on each employee must be maintained for a period of three (3) years from the date the record was created and a list of all persons working with the soil in the APHIS-PPQ approved facility must be maintained. 3) The permit holder must keep records of all shipments received and samples processed under this permit. These records must be retained for a period of three (3) years after disposal of the soil, or (3) years after its transfer to another APHIS-PPQ approved facility. If soil is transferred between approved facilities, its identity must be maintained for traceability. The records must include: a. Date of arrival of each shipment. b. Origin of the regulated soil. c. Total weight of regulated soil in each shipment. d. Date and weight of disposed or transferred amounts of regulated soil. e. Method of disposal or location where the regulated soil was transferred to. 4) All records retained under this permit must be made available to Federal and State regulators upon request.

12 · Adequate protective clothing must be worn when working with soil and infected/infested samples so that movement of plant pests out of the facilities on hands, clothing, and shoes does not occur.
· The laboratory floor must be uniform (i.e., no cracks/defects) and made of materials that can be cleaned. The floor must be maintained free of soil and infected/infested material.
· Work benches must be uniform (i.e., no crack/defects) and made of materials that can be cleaned. When not working with the regulated material, the benches must be cleaned and maintained free of soil and infected/infested material.
· Any sink that drains water used for processing infested soil, infested growing media, and infected plant materials must be equipped with traps that allow collection of waste water.
· All waste water from sink traps or other sources that potentially contains live pests or pathogens must be treated according to the devitalization and waste disposal condition in this permit before final disposal.

13 All packages must be opened within a laminar flow cabinet, or a Class I biosafety cabinet, or a fume hood. If you use a laminar flow cabinet or a fume hood, it must be turned off to avoid escape of potential plant pests into the environment.

END OF PERMIT CONDITIONS

Permit Number: 525-22-298-1948

THIS PERMIT HAS BEEN APPROVED ELECTRONICALLY BY THE FOLLOWING PPQ HEADQUARTER OFFICIAL VIA EFILE	DATE
APHIS eFile Automatic Issued Permit Regulated by 7 CFR 330	10/25/2022

Login Sample Receipt Checklist

Client: Eurofins VBM Laboratoriet A/S

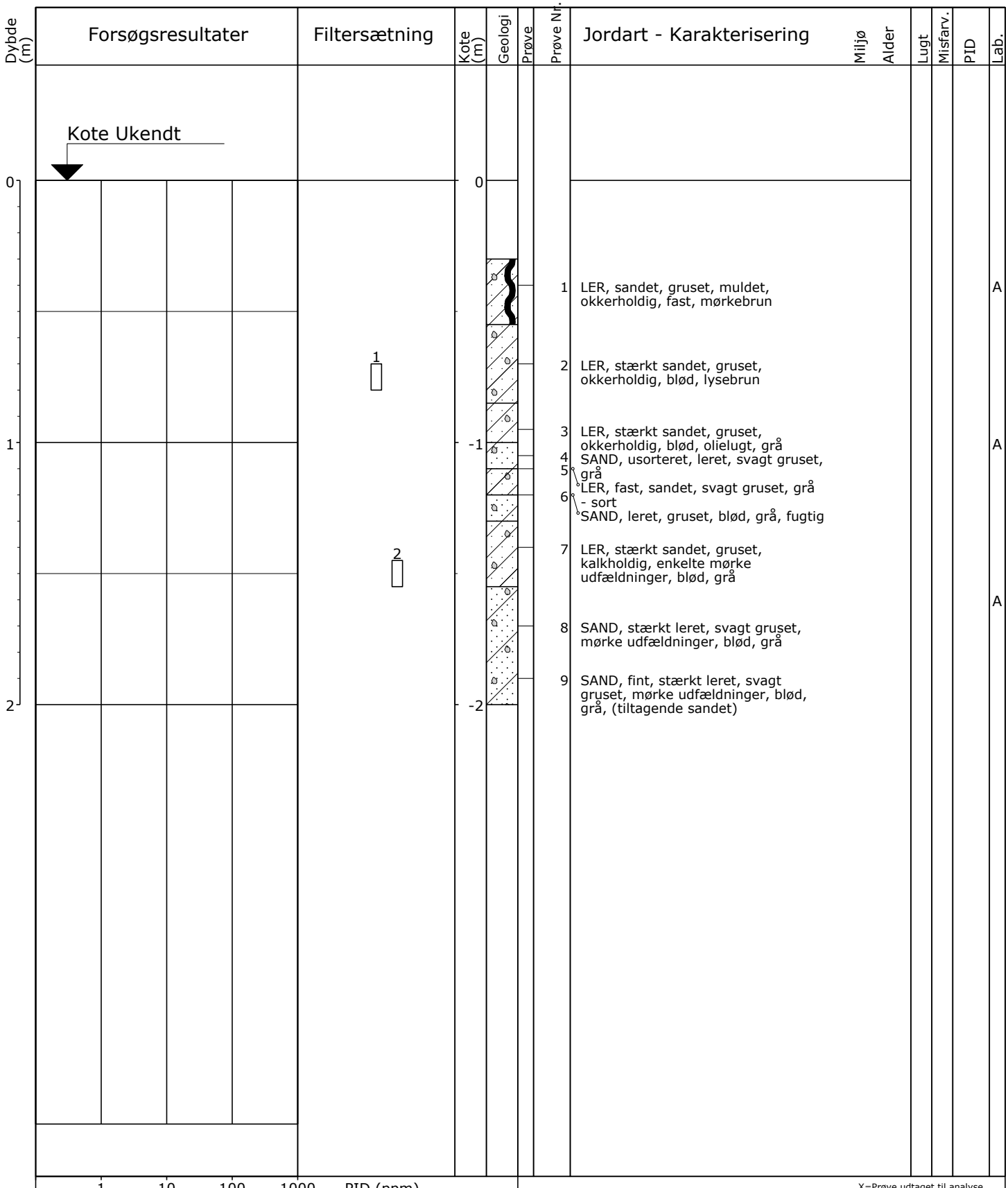
Job Number: 410-196590-1

Login Number: 196590
List Number: 1
Creator: Arroyo, Haley

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	No ice present, no attempt to chill
Cooler Temperature acceptable,where thermal pres is required(</=6C, not frozen).	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
WV:Container Temp acceptable,where thermal pres is required (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	No date or time on COC or containers.
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	False	No date or time on COC or sample containers.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	True	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Bilag B Boreprofiler



X=Prøve udtaget til analyse

! = Tydelig lugt observeret

\+ = Misfarvet

\- = Ikke Misfarvet

Pejlerør: 1:

Pejlerør: 2:

Boremetode: Kerneboring

Projektion: UTM32E89

Plan:

Sag: 471-00024 Odense Lufthavn, Shell Benzin Salg

Boret af: Niras A/S Dato: 2024.04.02 Bedømt af: MBLR DGU Nr.: Boring: KA1-1

Udarb. af: ASKN Kontrol: MRLA Godkendt: Dato: Bilag: S. 1/1

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Miljøprofil

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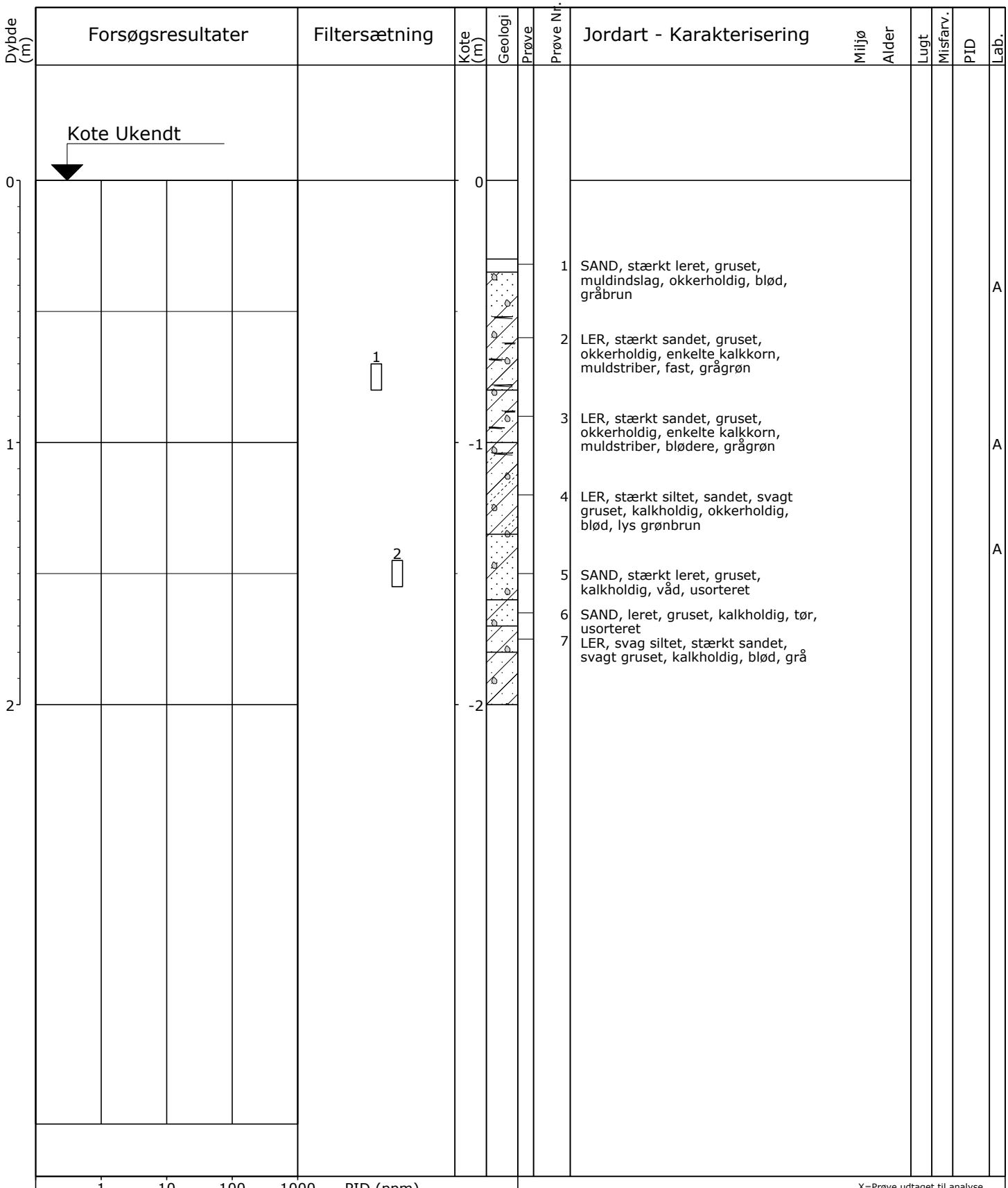

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Pejlerør: 2:

Boremetode: Kerneboring

Projektion: UTM32E89

Plan:

Sag: 471-00024 Odense Lufthavn, Shell Benzin Salg

Boret af: Niras A/S Dato: 2024.04.02 Bedømt af: MBLR DGU Nr.: Boring: KA2-1

Udarb. af: ASKN Kontrol: MRLA Godkendt: Dato: Bilag: S. 1/1

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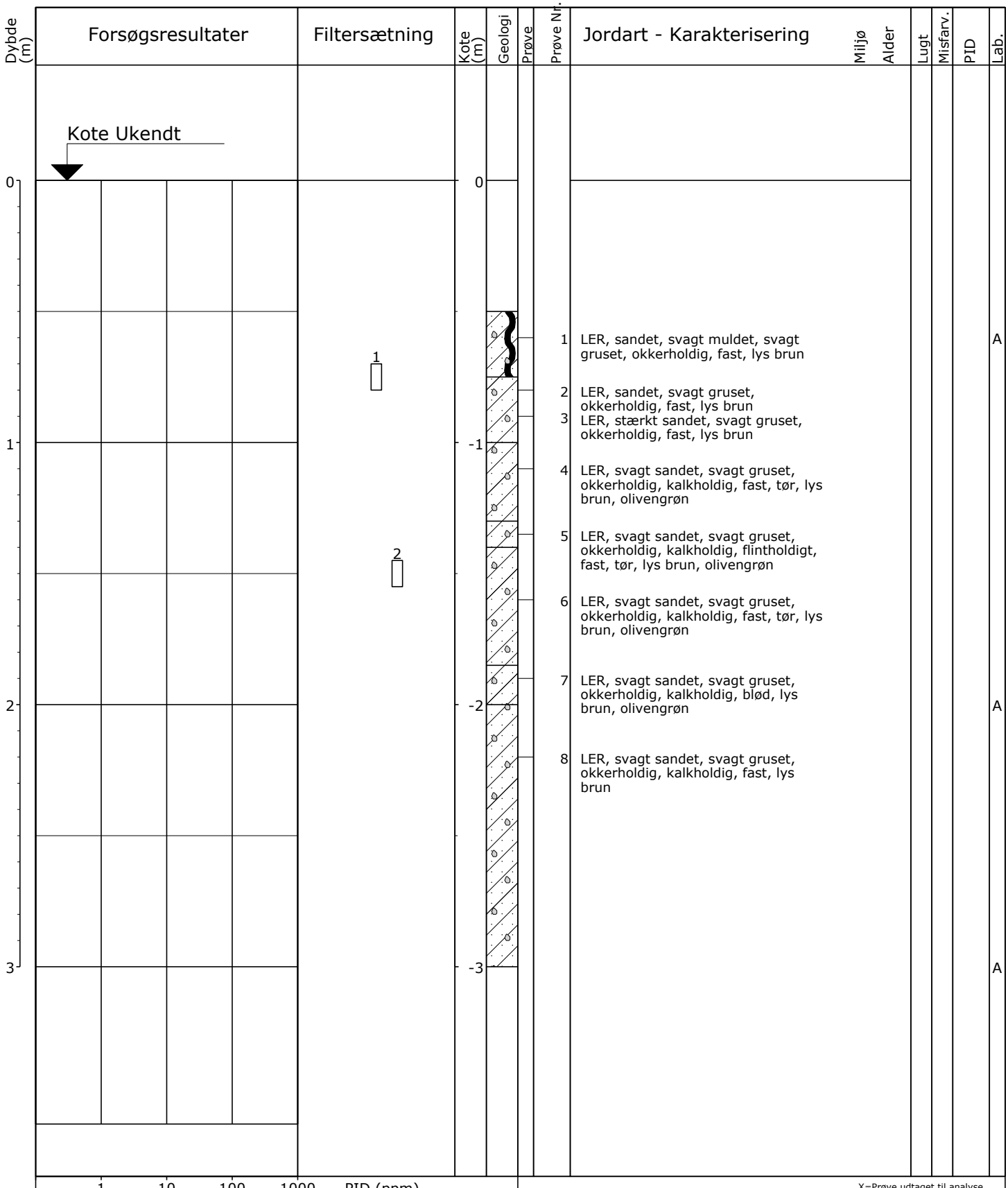

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- = Ikke Misfarvet

Pejlerør: 1:

Pejlerør: 2:

Boremetode: Kerneboring

Projektion: UTM32E89

Plan:

Sag: 451-00002 Cykelfabrik "Grand"

Boret af: Niras A/S Dato: 2024.04.02 Bedømt af: MBLR DGU Nr.: Boring: KB1-1

Udarb. af: ASKN Kontrol: MRLA Godkendt: Dato: Bilag: S. 1/1

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Miljøprofil

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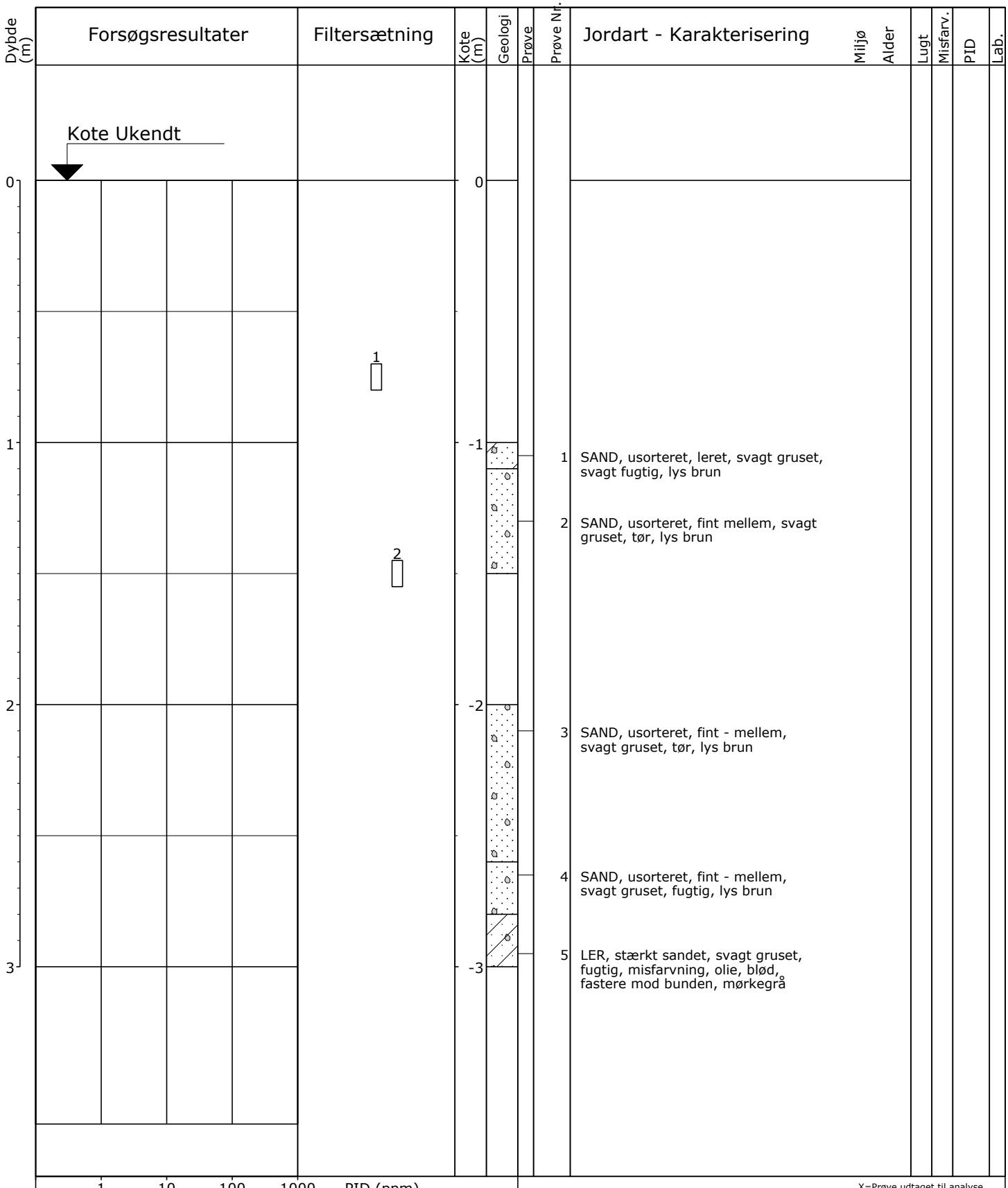

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Pejlerør: 1:

Pejlerør: 2:

Boremetode: Kerneboring

Projektion: UTM32E89

Plan:

Sag: 451-00002 Cykelfabrik "Grand"

Boret af: Niras A/S Dato: 2024.04.02 Bedømt af: MBLR DGU Nr.: Boring: KB2-1

Udarb. af: ASKN Kontrol: MRLA Godkendt: Dato: Bilag: S. 1/1

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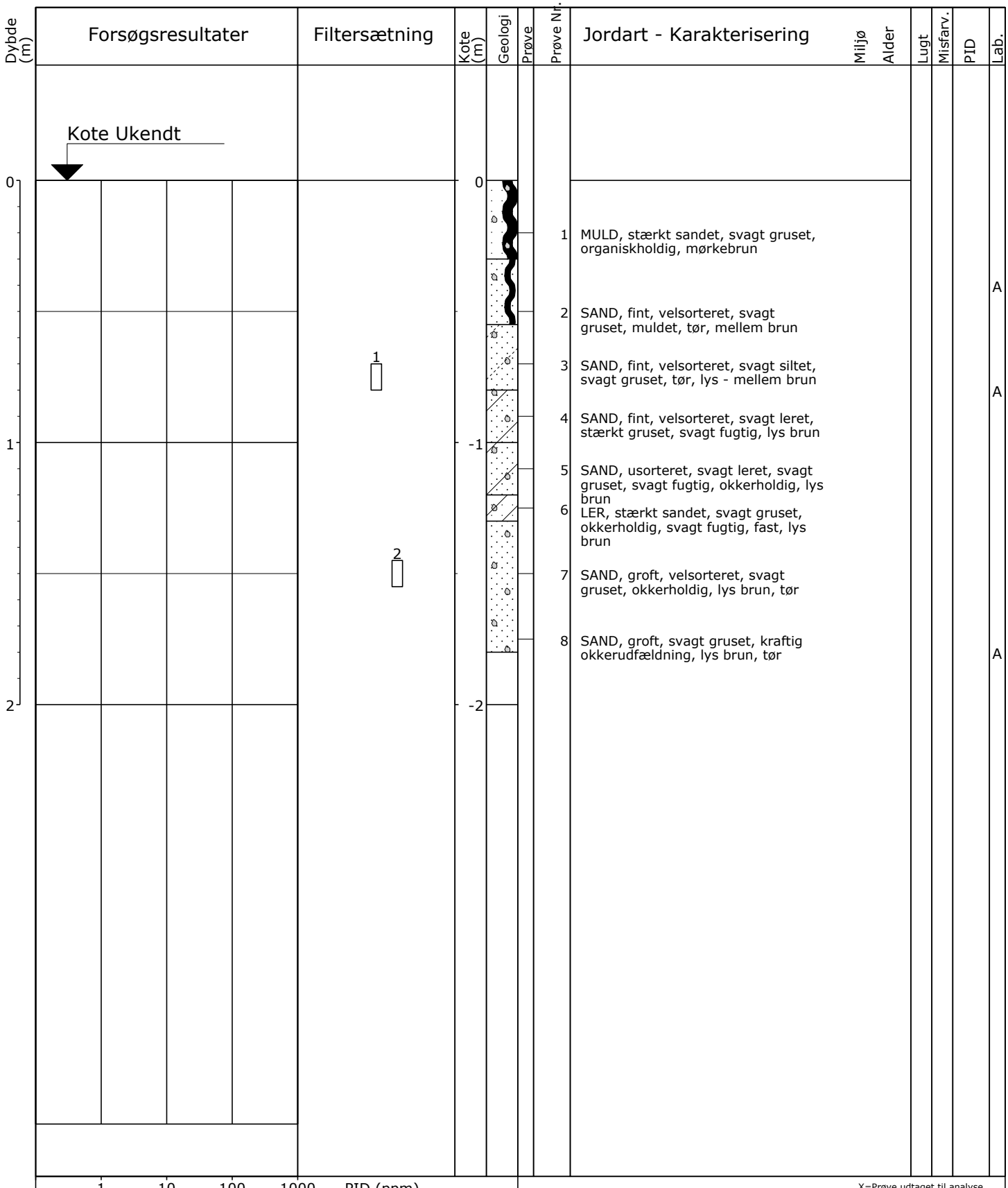

X=Prøve udtaget til analyse

! = Tydelig lugt observeret

+ = Misfarvet

- = Ikke Misfarvet

Pejlerør: 1:

Pejlerør: 2:

Boremetode: Kerneboring

Projektion: UTM32E89

Plan:

Sag: 605-00136 Vandel Flyveplads

Boret af: Niras A/S Dato: 2024.04.02 Bedømt af: MBLR DGU Nr.: Boring: KC2-1

Udarb. af: ASKN Kontrol: MRLA Godkendt: Dato: Bilag: S. 1/1

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Miljøprofil

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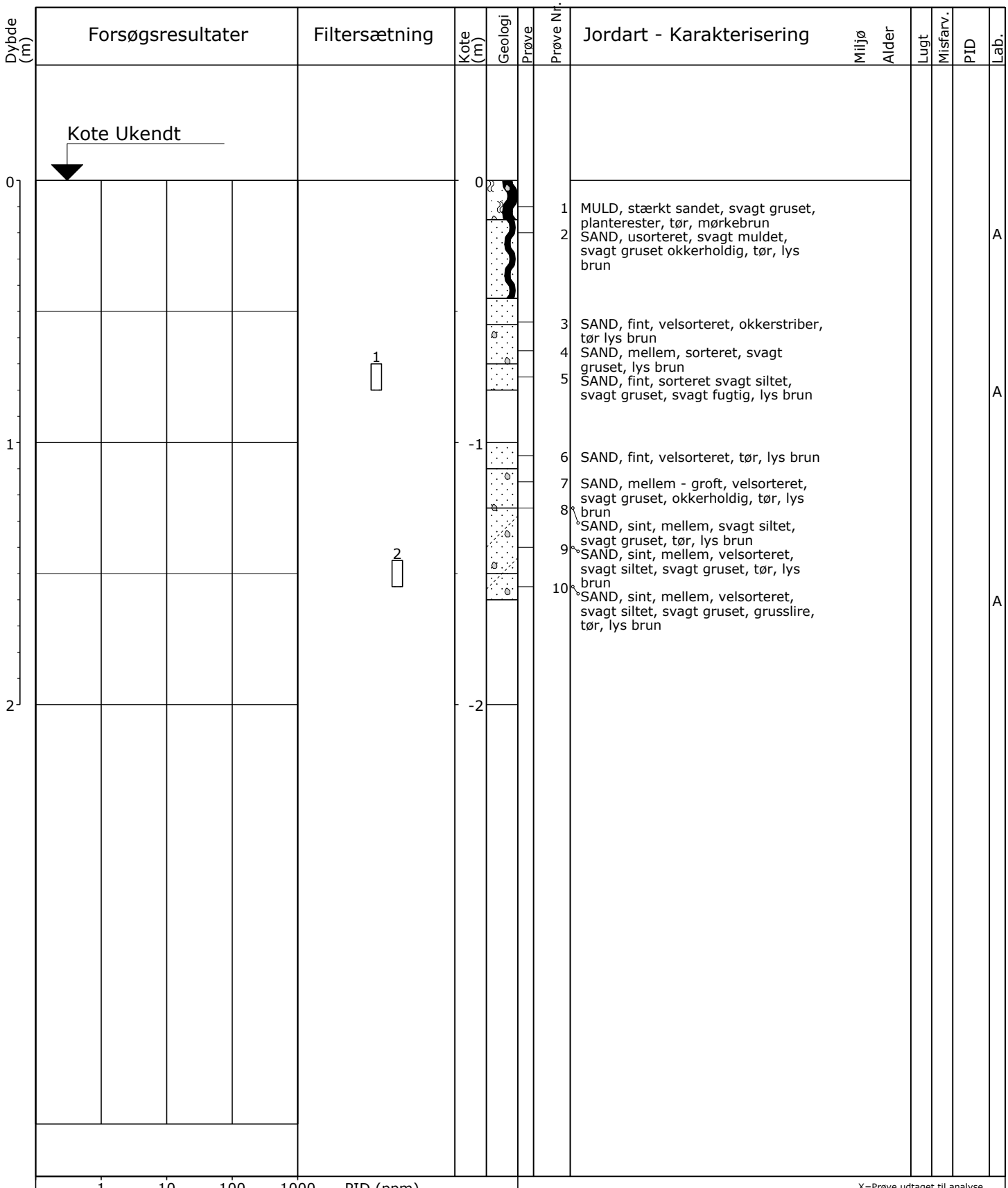

X=Prøve udtaget til analyse

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+ = Misfarvet

- = Ikke Misfarvet

Pejlerør: 1:

Pejlerør: 2:

Boremetode: Kerneboring

Projektion: UTM32E89

Plan:

Sag: 605-00136 Vandel Flyveplads

Boret af: Niras A/S Dato: 2024.04.02 Bedømt af: MBLR DGU Nr.: Boring: KC1-1

Udarb. af: ASKN Kontrol: MRLA Godkendt: Dato: Bilag: S. 1/1

RAMBØLL

Miljøprofil

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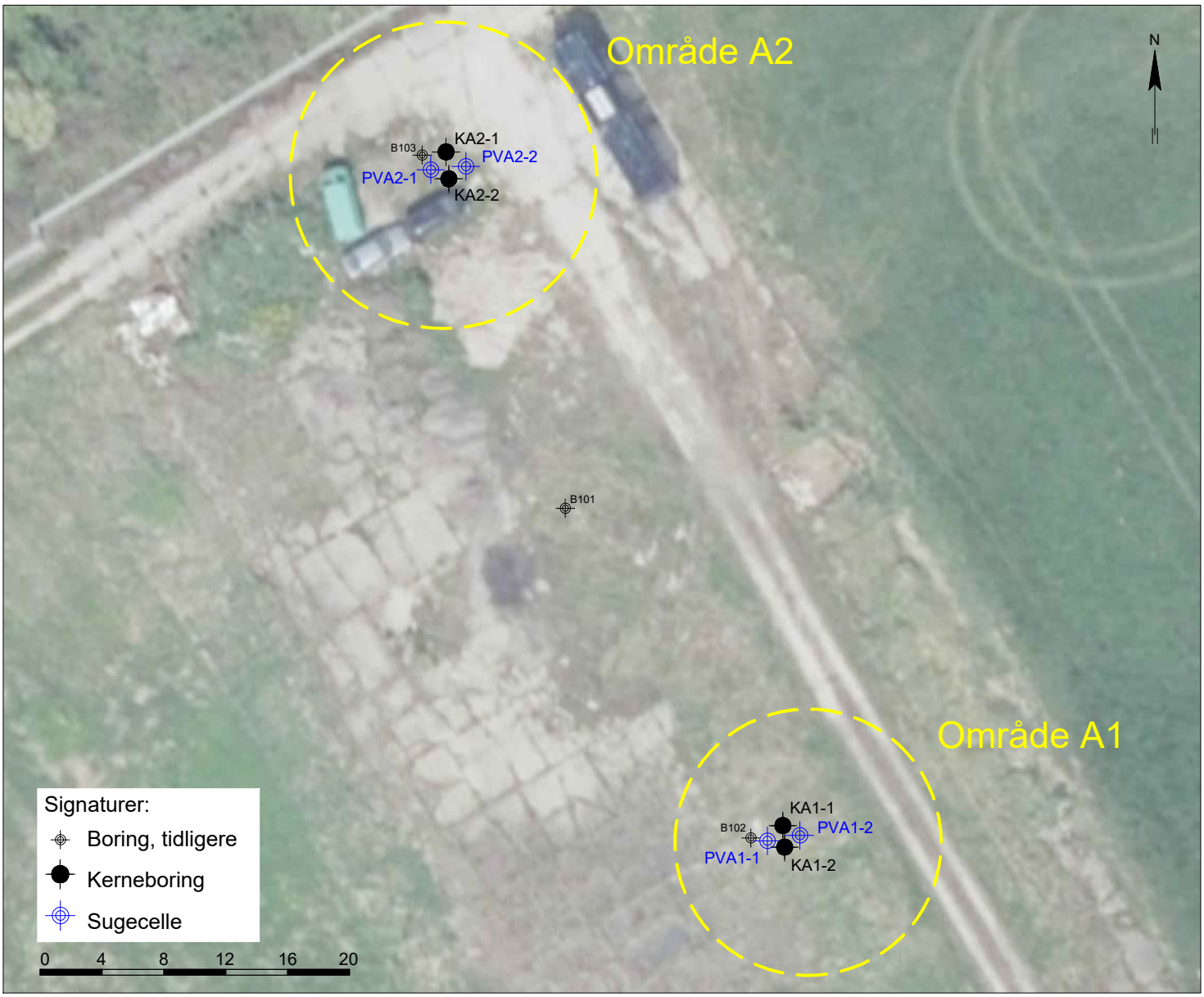
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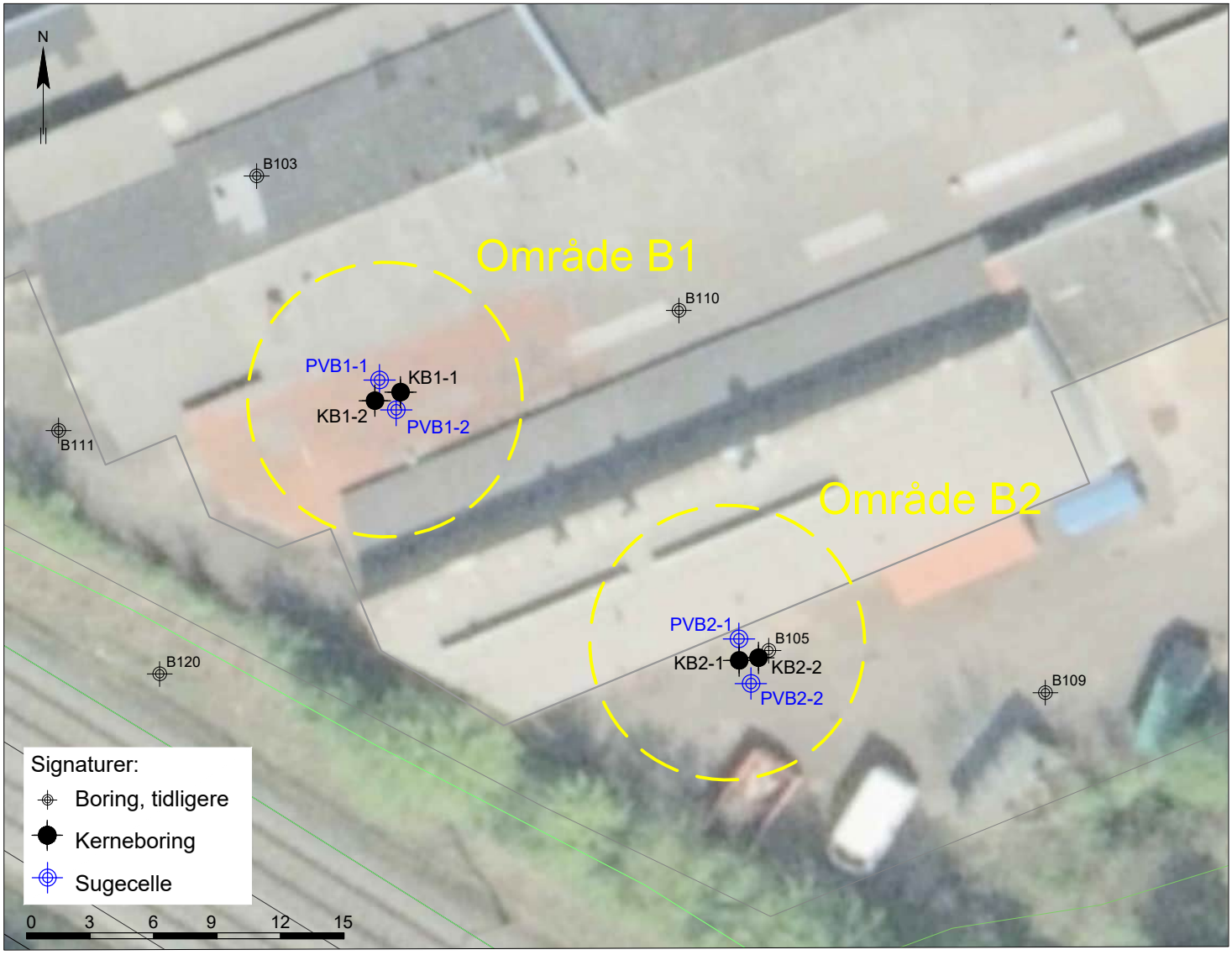
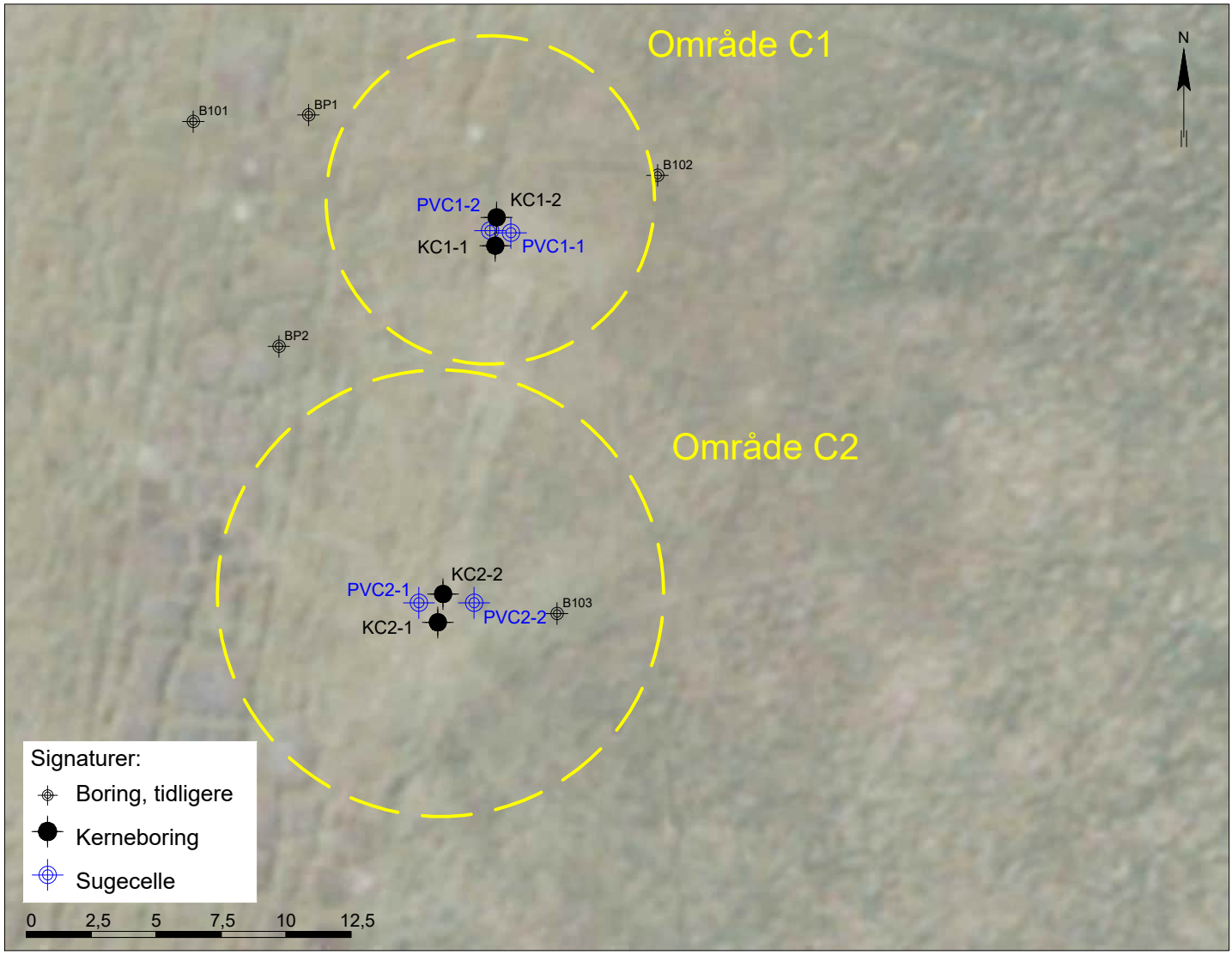
PVA1-2
PVA1-1
KA1-2
Signaturer:
Boring, tidligere
Kerneboring
Sugecelle
0
4
8
12
16
20


N
B103
Område B1
B110
PVB1-1
KB1-1
KB1-2
PVB1-2
B111
Område B2
PVB2-1
B105
KB2-1
KB2-2
PVB2-2
B120
B109
Signaturer:
Boring, tidligere
Kerneboring
Sugecelle
0
3
6
9
12
15


Område C1
Område C2
N
B101
BP1
B102
PVC1-2
KC1-2
KC1-1
PVC1-1
BP2
KC2-2
PVC2-1
KC2-1
PVC2-2
B103
Signaturer:
Boring, tidligere
Kerneboring
Sugecelle
0
2,5
5
7,5
10
12,5

Bilag D Data samlet

Det samlede datasæt kan rekvireres hos regionen i excelformat.

Overblik over analyserapporter fra eurofins (RambøII)

Analyserapport nr.	Excelfane - Navn
AR-24-VL-01013736-01.pdf	Jord_PFAS22
AR-24-VL-01025207-01.pdf	Jord_PFAS22
AR-24-VL-01038135-01.pdf	Jord_EOF
AR-24-VL-01058092-02.pdf	Jord_TOP22
AR-24-VL-01020444-01.pdf	Vand_PFAS22
AR-24-VL-01038134-01.pdf	Vand_AOF+Fluorid
AR-24-VL-01060821-02.pdf	VandTOP22
PFAS_70_results (58092+60821)	Jord+Vand_PFAS70

		KA1-1				KA2-1			
		0,4	0,8	1	1,6	0,4	0,8	1	1,4
Jord		EUAA59-224-02520701/0,8				862-2024-02520702/0,8			
Tørstof	%	81	81	84	89	85	82	79	88
PFBA	µg/kg ts.	0,27	1,1	1,5	0,48	0,69	0,53	1,5	0,39
PFBS	µg/kg ts.	<0,03	0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03
PFPeA	µg/kg ts.	1,5	9,7	12	3,6	5,8	4,3	12	3,2
PFPeS	µg/kg ts.	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
PFHxA	µg/kg ts.	0,92	3,7	4,8	2,3	4,9	2,6	8,6	2,1
PFHxS	µg/kg ts.	0,61	1,3	0,78	0,18	0,5	0,14	0,44	0,18
PFHpA	µg/kg ts.	0,55	3,5	1,3	0,3	0,88	0,54	1,6	0,31
PFHpS	µg/kg ts.	0,12	0,08	<0,03	0,031	0,2	<0,03	0,057	<0,03
PFOA	µg/kg ts.	0,58	0,16	0,09	0,12	0,42	0,099	0,19	0,056
PFOS	µg/kg ts.	360	16	13	6,2	25	3,1	7,4	3,5
6:2 FTS	µg/kg ts.	89	0,99	5,9	52	130	41	130	29
PFOSA	µg/kg ts.	0,12	<0,1	0,16	<0,1	<0,1	<0,1	<0,1	<0,1
PFNA	µg/kg ts.	1,1	0,082	<0,03	<0,03	0,17	0,048	0,083	<0,03
PFNS	µg/kg ts.	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2
PFDA	µg/kg ts.	0,38	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
PFDS	µg/kg ts.	<0,03	0,096	0,048	<0,03	<0,03	<0,03	<0,03	<0,03
PFUnDA	µg/kg ts.	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
PFUnDS	µg/kg ts.	<1	<1	<1	<1	<1	<1	<1	<1
PFDoDA	µg/kg ts.	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
PFDoDS	µg/kg ts.	<1	<1	<1	<1	<1	<1	<1	<1
PFTrDA	µg/kg ts.	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
PFTrDS	µg/kg ts.	<1	<1	<1	<1	<1	<1	<1	<1
Sum af PFOA, PFOS, PFNA og PFHxS (linær og forgrenede)	mg/kg ts.	0,36229	0,018	0,0139	0,007	0,0261	0,0034	0,0081	0,00374
(RAMBØLL) Sum af PFAS 22	µg/kg ts.	455,15	36,738	39,578	65,21	168,56	52,357	161,87	38,736
TOC, totalt org. kulstof	% (w/w) ts.	1,5		0,5	0,2	0,3		0,3	0,4

KB1-1			KB2-1			KC1-1			KC2-1			
0,6	2	3	2	2,6	3	0,2	0,8	1,6	0,4	0,8	1,6	1,8
									862-2024-02520703/1,6			
87	81	88	89	88	82	98	86	95	87	85	93	91
<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	0,1	<0,1	<0,1	<0,1
<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03
<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	0,16	<0,03	<0,03	<0,03
<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	0,032	<0,03	<0,03	0,053	<0,03	<0,03	<0,03
<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	0,21	0,14	0,14	0,12	<0,03	0,1	0,11
<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	0,06	<0,03	<0,03	<0,03
<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	0,032	0,061
<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	0,034	<0,03	0,034	0,11	<0,03	<0,03	<0,03
<0,06	<0,06	<0,06	0,85	0,11	6,2	1,8	1,5	3,3	5,5	1,7	4,9	0,53
<0,06	<0,06	<0,06	<0,06	<0,06	<0,06	<0,06	<0,06	<0,06	<0,06	<0,06	<0,06	<0,06
<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03
<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2	<0,2
<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03	<0,03
<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
#	#	#	9E-04	0,0001	0,006	0,002	0,0016	0,0035	0,0057	0,0017	0,005	0,0006
0	0	0	0,85	0,11	6,2	2,076	1,64	3,474	6,103	1,7	5,032	0,701
0,3	< 0,1	0,8	0,5	0,1	0,5	0,6	< 0,1	< 0,1	0,8	0,5		< 0,1

TOP22 analyser					
Prøveid		862-2024-05809201	862-2024-05809202	862-2024-05809203	862-2024-05809204
Dybde		1 m	1,2 m	1,6 m	1,6 m
Prøvenavn		KA1-2 (1)	KA2-2 (1,2)	KB1-2 (1,6)	KC2-2 (1,6)
Tørstof	%	84,9	81,4	88,1	95,5
PFBA	µg/kg ts.	3,5	6,8	<2,0	<4,0
PFBS	µg/kg ts.	<0,10	<0,10	<0,10	<0,20
PFPeA	µg/kg ts.	9,4	14	<2,0	<4,0
PFPeS	µg/kg ts.	0,1	<0,10	<0,10	<0,20
PFHxA	µg/kg ts.	15	10	<0,10	0,73
PFHxS	µg/kg ts.	0,38	0,17	<0,10	0,22
PFHpA	µg/kg ts.	2,8	2	<0,10	<0,20
PFHpS	µg/kg ts.	<0,10	<0,10	<0,10	<0,20
PFOA	µg/kg ts.	0,86	0,15	0,11	<0,20
PFOS	µg/kg ts.	7,7	2	<0,10	0,91
6:2 FTS	µg/kg ts.	<0,10	<0,10	<0,10	<0,20
PFOSA	µg/kg ts.	<0,10	<0,10	<0,10	<0,20
PFNA	µg/kg ts.	<0,10	<0,10	<0,10	<0,20
PFNS	µg/kg ts.	<0,20	<0,20	<0,20	<0,40
PFDA	µg/kg ts.	<0,10	<0,10	<0,10	<0,20
PFDS	µg/kg ts.	<0,20	<0,20	<0,20	<0,40
PFUnDA	µg/kg ts.	<0,20	<0,20	<0,20	<0,40
PFUnDS	µg/kg ts.	<0,20	<0,20	<0,20	<0,40
PFDoDA	µg/kg ts.	<0,20	<0,20	<0,20	<0,40
PFDoDS	µg/kg ts.	<1,0	<1,0	<1,0	<2,0
PFTrDA	µg/kg ts.	<1,0	<1,0	<1,0	<2,0
PFTrDS	µg/kg ts.	<1,0	<1,0	<1,0	<2,0
Sum of PFAS SLV 11 (TOP) incl. ½ LOQ	µg/kg ts.	40	35	2,5	6,5
Sum af PFAS (TOP) incl. ½ LOQ	µg/kg ts.	44	39	6,4	14
(Rambøll) Sum 22	µg/kg ts.	39,74	35,12	0,11	1,86

Jord EOF					
		KA1-2	KA2-2	KB1-2	KB2-2
Parameter▼	Enhed	0,8 m	1,8 m	2,2 m	2,8 m
Ekstraherbar Organisk Fluor	µg/kg ts.	<50,0	76,3	<50,0	<50,0
Tørstof	% rw	82,9	80,9	88,1	84,3

Prøvenummer		862-2024-02044402	862-2024-02044401	862-2024-02044404	862-2024-02044403	862-2024-02044406	862-2024-02044405	862-2024-02044408
Prøve mærke		PVA1-2	PVA1-1	PVA2-2	PVA2-1	PVB1-2	PVB1-1/2	PVB2-2/2
Dybde		0,75	1,5	0,75	1,5	1	2	2
Kunde Ref.:		EUAA59-24020444	EUAA59-24020444	EUAA59-24020444	EUAA59-24020444	EUAA59-24020444	EUAA59-24020444	EUAA59-24020444
Komponent	Enhed	Resultat	Resultat	Resultat	Resultat	Resultat	Resultat	Resultat
PFBA	ng/l	3300	8300	2900	3200	<0,60	9,4	2,6
PFBS	ng/l	20	79	<10	<10	<0,30	3	<0,30
PFPeA	ng/l	28000	79000	22000	24000	<0,30	1,3	1,1
PFPeS	ng/l	35	110	16	12	<0,30	0,67	<0,30
PFHxA	ng/l	7200	30000	18000	17000	<0,30	2,1	1,5
PFHxS	ng/l	570	1900	510	250	0,43	2,1	0,35
PFHpA	ng/l	2600	7500	2300	2300	<0,30	1,5	1,3
PFHpS	ng/l	35	38	57	20	<0,30	0,45	<0,30
PFOA	ng/l	150	330	320	180	<0,30	8	3,8
PFOS	ng/l	110	8800	2400	160	<0,20	4,5	8,7
6:2 FTS	ng/l	29000	100000	150000	150000	<0,30	<0,30	<0,30
PFOSA	ng/l	<10	<10	<10	<10	<0,30	<0,30	0,44
PFNA	ng/l	30	21	63	48	<0,30	<0,30	<0,30
PFNS	ng/l	<10	<10	<10	<10	<0,30	<0,30	<0,30
PFDA	ng/l	<10	<10	<10	<10	<0,30	<0,30	<0,30
PFDS	ng/l	<10	<10	<10	<10	<0,30	<0,30	<0,30
PFUnDA	ng/l	<10	<10	<10	<10	<0,30	<0,30	<0,30
PFUnDS	ng/l	<10	<10	<10	<10	<0,30	<0,30	<0,30
PFDoDA	ng/l	<10	<10	<10	<10	<0,30	<0,30	<0,30
PFDoDS	ng/l	<10	<10	<10	<10	<1,0	<1,0	<1,0
PFTrDA	ng/l	<10	<10	<10	<10	<1,0	<1,0	<1,0
PFTrDS	ng/l	<10	<10	<10	<10	<0,30	<0,30	<0,30
Sum af PFOA, PFOS, PFNA og PFHxS	ng/l	860	11000	3300	640	0,43	15	13
Sum af PFAS	ng/l	71000	240000	200000	200000	0,43	33	20

862-2024-02044407	862-2024-02044410	862-2024-02044409	862-2024-02044412	862-2024-02044411
PVB2-1/33	PVC1-2/0,75 0,75	PVC1-1/1,5 1,5	PVC2-2/0,75 0,75	PVC2-1/1,5 1,5
EUAA59-24020444	EUAA59-24020444	EUAA59-24020444	EUAA59-24020444	EUAA59-24020444
Resultat	Resultat	Resultat	Resultat	Resultat
<20	10	14	57	10
<10	5,1	5,7	0,97	0,95
<10	16	23	60	13
<10	16	22	2,8	2,9
<10	45	45	26	7,6
<10	240	360	44	84
<10	6,8	7,6	8,4	3,3
<10	5	8,7	1,6	4
<10	26	29	13	7,3
4600	150	78	64	380
<10	0,8	0,62	0,38	<0,30
<10	0,4	<0,30	<0,30	<0,30
<10	1,4	0,95	1,3	0,9
<10	<0,30	<0,30	<0,30	<0,30
<10	<0,30	<0,30	<0,30	<0,30
<10	<0,30	<0,30	<0,30	<0,30
<10	<0,30	<0,30	<0,30	<0,30
<10	<0,30	<0,30	<0,30	<0,30
<10	<0,30	<0,30	<0,30	<0,30
<10	<1,0	<1,0	<1,0	<1,0
<10	<1,0	<1,0	<1,0	<1,0
<10	<0,30	<0,30	<0,30	<0,30
4600	420	470	120	470
4600	520	590	280	510

AOF, Fluorid,							
Prøvenummer		862-2024-03813401	862-2024-03813402	862-2024-03813403	862-2024-03813404	862-2024-03813405	862-2024-03813406
Prøve mærke		PVA1-2/0,75	PVA2-1/1,5	PVB1-1/2	PVB2-1/3	PVC1-2/0,75	PVC2-1/1,5
Kunde Ref.:		EUAA59-24038134	EUAA59-24038134	EUAA59-24038134	EUAA59-24038134	EUAA59-24038134	EUAA59-24038134
AOF (Adsorberbar Organisk Fluor)	mg/l	0,069	0,15	< 0,012	< 0,012	< 0,012	< 0,012
Fluorid	mg/l	< 2,0	< 2,0	< 2,0	< 2,0	< 2,0	< 2,0

TOP22 analyser				
Batch	EUAA59-24060821			
Sagsnavn	AAU udvasknings projekt			
Sagsnummer/lokalitetsnr	Udvaskning af PFAS			
Udtagning: dato/initialer				
Modtaget på laboratoriet	########			
port (seneste rapportrevision)	03-03-2025/AR-24-VL-01060821-02			
Prøvenummer		862-2024-06082101	862-2024-06082102	862-2024-06082103
Prøve mærke		0,75	2	1,5
Kunde Ref.:		EUAA59-24060821	EUAA59-24060821	EUAA59-24060821
TOP		PVA1-2/0,75	PVB1-1/2	PVC2-1/1,5
Komponent	Enhed	Resultat	Resultat	Resultat
P37DMOA (TOP)	ng/l	<1000	<20	<1000
PFBA	ng/l	10000	7,2	<20
PFBS	ng/l	12	<3,0	<10
PFPeA	ng/l	42000	<3,0	14
PFPeS	ng/l	38	<3,0	<10
PFHxA	ng/l	9500	5,1	77
PFHxS	ng/l	660	<3,0	69
PFHpA	ng/l	2500	<3,0	<10
PFHpS	ng/l	53	<3,0	<10
PFOA	ng/l	140	3,6	<10
PFOS	ng/l	1500	3,8	250
6:2 FTS	ng/l	<10	<3,0	<10
PFOSA	ng/l	<10	<3,0	<10
PFNA	ng/l	41	<3,0	<10
PFNS	ng/l	<10	<3,0	<10
PFDA	ng/l	<10	<3,0	<10
PFDS	ng/l	<10	<3,0	<10
PFUnDA	ng/l	<10	<3,0	<10
PFUnDS	ng/l	<10	<3,0	<10
PFDoDA	ng/l	<10	<3,0	<10
PFDoDS	ng/l	<10	<3,0	<10
PFTrDA	ng/l	<10	<3,0	<10
PFTrDS	ng/l	<10	<3,0	<10
PFTeDA (TOP)	ng/l	<10	<3,0	<10
HPFHpA (TOP)	ng/l	<10	<3,0	<10
8:2 FTS (TOP)	ng/l	<20	<3,0	<20
PFHxDA (TOP)	ng/l	<10	<3,0	<10
4:2 FTS (TOP)	ng/l	<10	<3,0	<10
Sum PFAS (TOP)	ng/l	66000	20	410
Sum PFAS SLV 11 (TOP)	ng/l	66000	20	410
Indgår ikke i PFAS sum 22				

Client Sample ID: KA1-2, 1/58092-1 Lab Sample ID: 410-196590-1	**KA1-2**	
Jf. Analyserekvisition d. 11/10/24 er det KA1-2, 1		
Analyte	Analyte	Result (ng/g)
Perfluorooctanesulfonic acid (PFOS)	PFOS	5,6
Perfluoropentanoic acid (PFPeA)	PFPeA	5,1
Perfluoropentanesulfonic acid (PFPeS)	PFPeS	0,056
1H, 1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	6:2 FTS	0,43
Perfluorohexanoic acid (PFHxA)	PFHxA	1,8
Perfluorooctanoic acid (PFOA)	PFOA	0,061
Perfluorodecanesulfonic acid (PFDS)	PFDS	0,047
Perfluorohexanesulfonic acid (PFHxS)	PFHxS	0,44
Perfluorobutanoic acid (PFBA)	PFBA	0,68
Perfluoroheptanoic acid (PFHpA)	PFHpA	3,9
Perfluorononanoic acid (PFNA)	PFNA	0,057
Perfluoropropionic acid (PFPrA)	PFPrA	0,3
Perfluoropropanesulfonic acid (PFPrS)	PFPrS	0,034
Perfluorooctanesulfonamide (PFOSAm)	PFOSAm	0,054
	Sum	18,559
Client Sample ID: KA1-2, 1,6/58092-4 Lab Sample ID: 410-196590-3	**KC2-2**	
Jf. Analyserekvisition d. 11/10/24 er det KC2-2, 1,6		
Analyte	Analyte	Result (ng/g)
Perfluorooctanesulfonic acid (PFOS)	PFOS	1,6
Perfluorooctanoic acid (PFOA)	PFOA	0,05
Perfluorohexanesulfonic acid (PFHxS)	PFHxS	0,19
Perfluoroheptanesulfonic acid (PFHpS)	PFHpS	0,062
	Sum	1,902
Client Sample ID: PVA1-20, 75/60821-1 Lab Sample ID: 410-196590-4		
Jf. Analyserekvisition d. 4/10/24 er det PVA1-2, 0,75	**PVA1-2**	
Analyte	Analyte	Result (ng/L)
Perfluorooctanesulfonic acid (PFOS)	PFOS	1400
Perfluoropentanoic acid (PFPeA)	PFPeA	21000
1H, 1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	6:2 FTS	31000
Perfluorohexanoic acid (PFHxA)	PFHxA	6500
Perfluorobutanoic acid (PFBA)	PFBA	2800
Perfluoroheptanoic acid (PFHpA)	PFHpA	2000
Perfluoropropionic acid (PFPrA)	PFPrA	1100
	Sum	65800

Client Sample ID: KA1-2 1,6/58092-3	**KB1, 1,6**	No detections
Client Sample ID: PVB1-1, 1/60821-2	**PVB1-1, 1**	No detections
Client Sample ID: PVC2-1, 1,5/60821-3	**PVC2-1, 1,5**	No detections

Detection Summary

Client: Eurofins VBM Laboratoriet A/S
Project/Site: AAUe udvaskningsprojekt

Job ID: 410-196590-1

Client Sample ID: KA1-2, 1/58092-1 — Lab Sample ID: 410-196590-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	5.6	H B cn	0.068	0.040	ng/g	1	☼	537 IDA	Total/NA
Perfluoropentanoic acid (PFPeA)	5.1	H cn	0.068	0.027	ng/g	1	☼	537 IDA	Total/NA
Perfluoropentanesulfonic acid (PFPeS)	0.056	J H cn	0.068	0.025	ng/g	1	☼	537 IDA	Total/NA
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	0.43	H cn	0.11	0.056	ng/g	1	☼	537 IDA	Total/NA
Perfluorohexanoic acid (PFHxA)	1.8	H cn	0.068	0.022	ng/g	1	☼	537 IDA	Total/NA
Perfluorooctanoic acid (PFOA)	0.061	J H cn	0.068	0.025	ng/g	1	☼	537 IDA	Total/NA
Perfluorodecanesulfonic acid (PFDS)	0.047	J H cn	0.068	0.024	ng/g	1	☼	537 IDA	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.44	H cn	0.068	0.022	ng/g	1	☼	537 IDA	Total/NA
Perfluorobutanoic acid (PFBA)	0.68	H cn	0.068	0.027	ng/g	1	☼	537 IDA	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.9	H cn	0.068	0.027	ng/g	1	☼	537 IDA	Total/NA
Perfluorononanoic acid (PFNA)	0.057	J H cn	0.068	0.026	ng/g	1	☼	537 IDA	Total/NA
Perfluoropropionic acid (PFPrA)	0.30	J H cn	0.57	0.23	ng/g	1	☼	537 IDA	Total/NA
Perfluoropropanesulfonic acid (PFPrS)	0.034	J H cn	0.068	0.024	ng/g	1	☼	537 IDA	Total/NA
Perfluorooctanesulfonamide (PFOSAm)	0.054	J H cn	0.068	0.024	ng/g	1	☼	537 IDA	Total/NA

Client Sample ID: KA1-2 1,6/58092-3 — Lab Sample ID: 410-196590-2

No Detections.

Client Sample ID: KA1-2, 1,6/58092-4 — Lab Sample ID: 410-196590-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	1.6	H I B cn	0.062	0.036	ng/g	1	☼	537 IDA	Total/NA
Perfluorooctanoic acid (PFOA)	0.050	J H cn	0.062	0.023	ng/g	1	☼	537 IDA	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.19	H cn	0.062	0.020	ng/g	1	☼	537 IDA	Total/NA
Perfluoroheptanesulfonic acid (PFHpS)	0.062	H cn	0.062	0.021	ng/g	1	☼	537 IDA	Total/NA

Client Sample ID: PVA1-20, 75/60821-1 — Lab Sample ID: 410-196590-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	1400		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
Perfluoropentanoic acid (PFPeA)	21000		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	31000		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
Perfluorohexanoic acid (PFHxA)	6500		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
Perfluorobutanoic acid (PFBA)	2800		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2000		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA
Perfluoropropionic acid (PFPrA)	1100		1000	1000	ng/L	1		EPA 537 (mod)	Total/NA

Client Sample ID: PVB1-1, 1/60821-2 — Lab Sample ID: 410-196590-5

No Detections.

Client Sample ID: PVC2-1, 1,5/60821-3 — Lab Sample ID: 410-196590-6

No Detections.

This Detection Summary does not include radiochemical test results.

Bilag E Litteraturstudie

PFAS litteraturstudie: Udvaskning af PFAS fra jord i den umættede zone

Udvaskning af PFAS fra forurenet jord er en kendt og alvorlig problemstilling, bl.a. fordi udvaskning af PFAS kan medføre forurening af grundvandsressourcen, som udgør basis for drikkevandsforsyningen.

Formålet med litteraturstudiet er at indsamle viden, som kan anvendes i forbindelse med felt – og laboratoriearbejdet i projektet. Litteraturstudiet omfatter følgende:

- Resume af udførte udvaskningsforsøg for PFAS ved lave koncentrationer (ca. 400 µg/kg)
- Kemiske/fysiske egenskaber relevante for udvaskning af PFAS fra jord ved lave koncentrationer (ca. 400 µg/kg)
- Sorptionsegenskaber for PFAS, herunder hvilke parametre der kan have indflydelse på sorption (pH, organisk stof mv.)

Udvaskningsforsøg for PFAS fra jord

Nedenfor gennemgås en række studier af udvaskningsforsøg. Forsøgene er relevante ved PFAS-koncentrationer i jord på op til 400 µg/kg TS for sum 22 PFAS i umættet zone. Se Tabel 1 for opsummering og sammenligning af studierne i forhold til forsøgstype, jordtype, PFAS-forbindelser mv.

Mclachlan et al. (2019) undersøgte udvaskning af 13 forskellige PFAS-forbindelser i lysimeter felt-tests for forskellige typer landbrugsjord ved koncentrationer på mellem 0,1 mg/kg - 10 mg/kg. Resultaterne viste, at udvaskning er positivt korreleret med PFAS-koncentrationen og negativt korreleret med antallet af fluorerede C-atomer. Det vil sige at udvaskningen er størst for PFAS med kortere kædelængder og ved høje koncentrationer i jorden.

Dette blev bekræftet af Weidemann et al. (2022), der ved 2-årige kolonneforsøg med forskellige jordtyper og 10 forskellige PFAS-forbindelser med koncentrationer på 1 mg/kg våd jord, undersøgte hvordan PFAS udvaskes fra kolonnen over tid. Studiet viste dels, at kortkædede PFAS havde den hurtigste gennembrudstid og største genfindelsesrate, men også at massebalancen efter to år ikke passede for hverken PFAS med kortere- (C<6) - eller lange kædeder (C>6) PFAS, og at den kendte startmængde af PFAS ikke kunne genfindes i hverken afløbsvand eller i jorden fra kolonnen. Resultaterne indikerede, at udvaskning for PFAS er en kompleks proces, hvor nedbrydnings- og omdannelsesdynamik, med såkaldte precursore, spiller en stor rolle.

Röhler et al. (2021) undersøgte, hvordan langtidsudvaskning fra landbrugsjord kan forudsiges med laboratoriekolonneforsøg, hvordan udvaskningen fra landbrugsjord er sæsonafhængig, og hvor længe udvaskning kan forventes fra forurenet landbrugsjord. Efter en moniteringsperiode på 12 år og analyse for 10 forskellige PFAS, viste resultaterne, at udvaskningen af PFOS og PFOA kunne forudsiges tilfredsstillende med kolonneforsøg i laboratoriet, men at både kort- og langkædede PFAS udviste længere feltudvaskningstider end det forventede fra kolonneforsøgene. Der er observeret en sæsonbetinget udvaskning for kortkædede PFSA med en stigning i koncentrationen på grund af omdannelse af precursorer i forår og sommer og efterfølgende udvaskning i efterår og vinter. Der er ikke angivet en forklaring på observationen. Langkædede PFAS udviste ikke samme tydelige mønster. Felttestene indikerede, at en total udvaskning af PFAS vil tage årtier, og at dynamikken med precursorer skal undersøges bedre for at opnå bedre forståelse for udvaskningen. Röhler et al. (2023) bekræftede ved kolonneforsøg med forurenet landbrugsjord, at C4-C8 PFCA (per- og polyfluorerede carboxylsyrer) udvaskes hurtigere end >C8 PFCA. Efter udvaskningen af PFAS i kolonneforsøgene blev jorden brugt i batch-forsøg til at undersøge koncentrationen af PFCA i vandfasen over tid. Resultaterne

viste, at under aerobe forhold, steg C4-C8 PFCA-koncentrationen lineært gennem hele forsøgsperioden med op til en faktor 29-222, på grund af omdannelse af precursorer. C10-C12 PFCA udviste ikke nogen koncentrationsstigning under forsøget.

Kabiri et al. (2022) undersøgte PFAS udvaskning i 12 forskellige jordtyper med Aqueous Film Forming Foam, (AFFF) forureninger, dvs. forureninger hvor der har været anvendt brandslukningsskum, ved forskellig pH og ved forskellig salinitet. Den samlede PFAS-koncentration varierede fra 17,7 µg/kg op til 830.000 µg/kg. Resultaterne viste, at udvaskningen styres primært af opløsningens pH, forholdet mellem jord og vand, udvaskningstiden og PFAS-forbindelsens kemiske struktur, dvs. kædelængde og funktionel gruppe. Udvaskningen viste sig mindre afhængig af jordegenskaber som indhold af organisk kulstof (foc), lerindhold og kornstørrelsesfordeling. Kortkædede PFAS blev hurtigt udvasket uanset pH. For PFAS med 8 og 9 kulstofatomer (C8 og C9) var udvaskningen større ved højere pH, mens der stort set ikke blev observeret nogen udvaskning for de længste PFAS uanset testforhold. For PFAS med samme kædelægnde var udvaskningen afhængig af den funktionelle gruppe med størst udvaskning af PFCA og mindre af PFSA (perfluorerede sulfanilsyrer) og perfluorerede sulfonamider.

Høisæter & Breedveld (2022) opstillede kolonneforsøg med udvaskning af PFAS i varierende koncentrationer op til sum_{12} = 1097 µg/kg i fire forskellige sandede jorder med varierende organisk indhold (TOC). Det totale gennemstrømmede vandvolumen svarede til ca. 100 års naturlig infiltration. Op imod halvdelen af PFOS-mængden blev ikke udvasket fra sandet jord, og der var ikke nogen direkte korrelation mellem udvaskning og TOC. Et tidligere studie fra Høisæter et al. (2019) undersøgte PFAS-udvaskning i den umættede zone vha. kolonneforsøg med op til 6500 µg/kg i jord fra en norsk AFFF-forurenet grund, og sammenlignede den estimerede retardation med feltestimater fra den samme forurenede grund. Feltestimaterne for PFOS-retardationen var væsentligt større (op til en retardationsfaktor (R) på 42) end i kolonneforsøgene (op til R=6,5). Forskellen vurderedes at stamme fra forskellen i kontinuiteten af vandtilførsel og graden af umættede forhold. Forskelle i mætningsgrad og betydningen af adsorption i luft-vand grænseflade blev fremhævet som en mulig årsag. Dette blev undersøgt nærmere af Lyu et al. (2018), som med kolonneforsøg med PFOA viste at 50-75 % af tilbageholdelsen af PFOA skyldtes adsorption i luft-vand grænsefladen. Studierne i Lyu et al (2018) er udført som kolonneforsøg hvor kolonnen er fyldt med rent sand og vandet som tilføres kolonnen spikes med PFOA. Der er således ikke tale om udvaskningsforsøg, hvor PFAS udvaskes fra forurenet jord. Men et studie som har til formål at undersøge betydningen af sorption til luft-vand grænsefladen. Studiet beskrives derfor ikke yderligere i nærværende.

Bierbaum et al. 2023 udførte immobiliseringsforsøg på jord (homogeniseret) med PFAS-koncentrationer på op til 655 µg/kg. Forsøgene blev udført i laboratoriet med henblik på at teste forskellige laboratoriemetoders evne til at vurdere udvaskningspotentialet af jorden efter tilførslen af biosolids (Biosolids i studiet stammer fra papir fibre). Artiklen konkluderede, at det er vigtigt med høje liquid to soild (L/S) forhold for at udvaskningspotentialet bliver sammenligneligt mellem laboratorieundersøgelserne.

Overordnet set peger de beskrevne udvaskningsforsøg på at:

- PFAS kædelængde har betydning for udvaskning
    - Kortkædede PFAS udvaskes i højere grad end langkædede PFAS
- Den funktionelle gruppe har betydning for udvaskning ved samme kædelængde
    - PFCA udvaskes hurtigere end øvrige.
- Omdannelsesdynamik med precursorer spiller en central rolle for udvaskning
    - Der kan både dannes og omsættes PFAS under udvaskningen

- Adsorption til luft-vand grænsefladen kan spille en stor rolle for PFAS udvaskning i umættet zone
    - Et studie pegede på 50-75 % af tilbageholdelse sker pga. adsorption i luft-vand grænsefladen.
- Jordegenskaber (fx organisk kulstof, lerindhold og kornstørrelsesfordeling) var mindre betydningsfulde for udvaskningen af PFAS.

Tabel 1 Opsummering af udvaskningsforsøg med PFAS. L/S er forholdet mellem vand og jord i forbindelse med udvaksningsforsøg.

Parameter / Studie	Forsøgs-Type	L/S	PFAS	Jordtype	pH	Konklusioner
McLachlan et al.(2019)	Lysimeter felttest	-	[1]	Sandet overfladejord	5,67	Koncentrationen i jord faldt i vækstsæson. Udvaskningen af PFAS var størst fra jord med høj koncentration.
Weidemann et al. (2022)	Kolonne	-	[2]	5 typer[9]	5,4-7	Kortkædet PFAS udvaskes hurtigere. Massebalance stemmer ikke.
Röhler et al. (2021)	Kolonne og felt	0,1-7:1	[3]	2 typer[8]	-	Feltudvaskning af PFOA og PFOS kan simuleres med kolonneforsøg.
Röhler et al. (2023)	Kolonne og batch	10:1	[4]	8 typer [10]	5,5-7,5	C4-C8 PFAS udvaskes hurtigere end >C8. C4-C8 PFAS dannes fortsat i sediment efter udvaskning.
Kabiri et al. (2022)	Kolonne og batch	20:1	[5]	12 typer [11]	6,5-9,2	Udvaskning styret af pH, L/S, udvaskningstid og kemisk struktur af PFAS.
Høisæter & Breedveld (2022)	Kolonne	0-10:1	[6]	4 typer: Usorteret medium til fint sand	-	Kun ca. halvdelen af PFOS blev udvasket ved kolonneforsøg.
Høisæter et al. (2019)	Kolonne og felt	-	[7]	Medium fint sand	-	Feltudvaskning fra umættet zone var langsommere end udvaskning i kolonneforsøg.
Lyu et al. (2018)	Kolonne	-	PFOA	Kvarts-sand	-	Sorption i umættet zone sker i høj grad i luft/vand grænsefladen
Bierbaum et al. (2023)	Kolonne, lysimeter og batch	> 30	PFAS Precur-sorer	Sandet overfladejord	8,2-10	Imobiliseringsforsøg. Det er vigtigt med høje L/S-forhold og lange forsøgstider.

[1] PFBA, PFPA,PFHxA, PFHpA,PFOA, PFNA, PFDA, PFUnA, PFDoA, PFTeA, PFOS
[2] PFBA, perfluoro butan sulfonisk syre, PFPeA, PFHxA, PFHxS, PFHpA, PFOA, PFOS, PFNA, PFDA
[3] PFBA, PFPeA, PFHxA, PFHpA, PFNA, PFDA, PFBS, PFHxS, PFOA, PFOS
[4] PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnA, PFDoA, PFOS

[5] PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFDS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnDA, PFDoDA, PFTrDA, PFTeDA
[6] 6:2 FTS, 8:2 FTS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDeA, PFBS, PFHxS, PFOS
[7] PFBS, PFHxS, PFHpS, PFOS, PFDeS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDeA, PFUnA, PFDoA, PFTrDA, PFTA, PFHxDA, PFOSA, 4:2 FTS, 6:2 FTS, 8:2 FTS, HPFHpA, PF-3,7-DMOA
[8] Type 1: topjord 0-30 cm ut, type 2: topjord 30-60 cm ut. Nøjagtig beskrivelse i artikel
[9] Sandet, siltet og leret overfladejord. Nøjagtig beskrivelse i artikel.
[10] a
[11] b

Kemisk/fysiske egenskaber, der er relevante for udvaskning af PFAS

I det følgende opsummeres PFAS-stoffernes komplekse og meget forskelligartede overfladeegenskaber med både hydrofobe egenskaber af C-F-kæden samt hydrofile egenskaber af den funktionelle gruppe. Disse egenskaber gør sorptionsegenskaberne afhængige af mange forskellige parametre (Kookana et al., 2023; Miljøstyrelsen, 2023; VMR, 2022, Lyu et al., 2018).

Sorbat kemi

De specifikke kemiske egenskaber for PFAS vurderes at være vigtige for sorption til jord (Kookana et al., 2023). Carbon-kædelængden er i litteraturen vist at være en vigtig faktor for størrelsen af K_d. K_d er en konstant som angiver forholdet mellem jord og vand. Korte PFAS (C3-C5) har alle en lav K_d med en mindre grad af afhængighed overfor jordtypen. Disse findes derfor primært i vandfasen, og er i høj grad mobile i grundvand (Nguyen et al., 2020). For PFAS med længere carbon-kæde (≥C6) er K_d positivt korreleret med kædelængden, og jo større kædelængde, desto større variation i K_d ved forskellige jordtyper. For PFAA'er (perfluoralkylsyrer) har den funktionelle gruppe desuden betydning for sorptionen. Flere studier peger på, at PFSA og sulfonamider sorberer mere kraftigt end PFCA, som dermed er mere mobilt (Campos Pereira et al., 2018; Kabiri et al., 2022; Nguyen et al., 2020).

Jordens indhold af organisk materiale

Som nævnt i VMR (2022) er det vanskeligt at estimere stoffordeling mellem vand og organisk materiale, $\log K_{oc}$, og deraf følgende beregning af fordelingen mellem jord og vand, K_d. Dette skyldes PFAS-forbindelsernes særlige komplekse kombination af hydrofobe og hydrofile overfladeegenskaber, som gør det vanskeligt at estimere K_{ow} (Kookana, 2023).

Studier af sammenhængen mellem fraktionen af organisk materiale i jorden, f_{oc}, og sorption af PFAS har ikke vist nogen entydig sammenhæng mellem de to. Umeh et al. (2021) viste ved batch sorptionsforsøg med en række forskellige jordtyper og efterfølgende statistisk analyse, at indholdet af organisk materiale korrelerede med sorptionen af PFOS, men at det kun forklarede ca. 35 % af variansen i K_d-estimaterne. Lignende resultater er opnået af Li et al. (2018) der ser en sammenhæng, men ikke en simpel korrelation og ikke en, der gælder for alle PFAS.

Sorption til organisk materiale er vigtigere for langkædede PFAS end for kortkædede (e.g. Nguyen et al., 2020).

Jordens mineralindhold og ladningskarakteristik

Flere studier peger på, at ladningen af PFAS-molekylet har betydning for elektrostatiske interaktioner med mineraler i jorden (Du et al., 2014; Mejia-Avendaño et al., 2020; Umeh et al., 2021). Positivt ladede PFAS (f.eks. perfluorerede sulfonamider) kan således adsorbere til negativt ladede ler mineraler som aluminiumsilikater, og phyllosilikater, mens negativt ladede PFAS (f. eks. PFCA og PFSA) i højere grad vil sorbere til positivt ladede jern- og aluminumoxider, som findes i mange jordtyper, men ikke til negativt ladede ler-partikler (Kookana et al., 2023).

Porevandskemi

Ion-styrke, ion-sammensætning, pH og opløst organisk kulstof (DOC) i porevandet er alle parametre, som har indflydelse på den overordnede ladning af jorden og dermed for det elektrostatiske potentiale. DOC kan forøge det negative elektrostatiske potentiale og spille en rolle for sorption, men resultaterne er ikke entydige (Qi et al., 2022). Tilstedeværelse af polyvalente kationer i porevand (fx Ca^{2+} og Mg^{2+} mfl.) har vist sig at have en indflydelse på sorption af visse PFAS (Campos Pereira et al., 2018), og højere ionstyrke har også vist sig at have en sammenhæng med højere K_d (Cai et al., 2022).

Øvrig forurening

Det forventes, at andre forureningsstoffer, som er tilstedeværende i jorden sammen med PFAS kan påvirke sorptionen, og dermed udvaskningen af PFAS (Kookana et al., 2023). Eksempelvis består AFFF af andre overfladeaktive stoffer (fx flere polære stoffer (MST, 2003)), som forventes at kunne påvirke PFAS-stoffernes sorption og udvaskning (Høisæter et al., 2019). Fx ved at nedsætte overfladespændingen eller opløseligheden. Effekten af den øvrige forurening er fortsat et område, hvor der mangler fuld forståelse.

Særlige faktorer under umættede forhold

Grundet PFAS' amphiphiliske egenskaber (både hydrofob og hydrofil/lipofil på samme tid), vil PFAS samles i grænsefladen mellem vand/luft og vand/fedt (Kookana et al., 2023; VMR, 2022). Da der i den umættede zone netop findes grænsefladen mellem vand og luft, har flere studier beskæftiget sig med, og vist, at PFAS sorption til luft-vand grænsefladen er en væsentlig faktor for den samlede PFAS sorption (Brusseau, 2018; Brusseau et al., 2019; Lyu et al., 2018). Følgende faktorer spiller en rolle i forbindelse med sorption til vand-luft grænsefladen:

- C-F kædelængde og funktionel gruppe
- Vandmætning af jord
- Jordtekstur og kornstørrelsesfordeling
- Porevandskemi og kationer i luft-vand grænsefladen
- Konkurrerende sorbater

C-F kædelængde og funktionel gruppe

Adsorption i luft-vand grænsefladen er i høj grad styret af C-F kædelængden. Således viste Lyu et al. (2022) ved kolonneforsøg, at sorption i luft-vand grænsefladen ikke var dominerende for kortkædede PFAS (C4-C7, 4-40% af samlet fastholdelse), mens sorption i luft/vand grænsefladen var den dominerende sorptionsproces for ≥C8 PFAS med ≥63% af den samlede fastholdelse. Sammenhængen mellem fordelingskoefficienten mellem vand og luft, $logK_H$, udviste en meget klar lineær korrelation med

C-F kædelængden (r^2=0,998). Modelstudier af Guo et al. (2022) indikerer, at PFCA sorberer mere til luft/vand grænsefladen end PFSA ved samme C-F-kædelængde.

Vandmætning og umættet zone

PFAS-forbindelser sorberer til luft-vand grænsefladen i den umættede zone og dette medfører en tilbageholdelse (retention) af PFAS-forbindelsen (Brusseau, 2023, Lyu et al. 2022). Hvor meget en specifik PFAS-forbindelse tilbageholdes afhænger af flere faktorer, herunder jordmatricen, vandmætningen og PFAS-forbindelsens fysisk kemiske egenskaber. Tilbageholdelsen er størst for lav vandmætning, og mindre kornstørrelser (Lyu et al., 2022), og er samtidig mest betydningsfuld for langkædede PFAS-forbindelser (Brusseau og Guo, 2022, Lyu et al., 2022, Morsing og Petersen, 2024). Tilbageholdelse af særligt langkædede PFAS-forbindelser på grænsefladen medfører op til 63 % tilbageholdelse (Lyu et al. 2022).

Som vist af (Brusseau, 2018; Lyu et al., 2018) fastholdes nogle PFAS i langt højere grad i umættet end i mættet jord. Selve vandmætningen er vanskelig, men vigtig at kvantificere, idet flow og transport i umættet jord ikke foregår ensartet. Der vil være områder med stillestående vand og områder med større flow (Hasan et al., 2020).

Tilbageholdelsen af PFAS ved luft-vand grænsefladen kan beskrives ved følgende ligning (Brusseau et al., 2019, Brusseau, 2021):

$$R = 1 + K_{ia}A_{ia}/\theta w \quad (1)$$

Hvor K_{ia} er luft-vand grænseflade adsorptionskoefficienten (cm), A_{IA} er det specifikke luft–vand grænsefladeareal (cm^2/cm^3) og θ_w (cm^3/cm^3) er vandindholdet.

Jordtekstur og kornstørrelsesfordeling

Studier peger på, at tekstur og kornstørrelsessammensætningen spiller en rolle for sorptionen til vand-luft grænsefladen under umættede forhold. Således observerede Brusseau et al. (2019), at forsøg i sand havde den relativt største andel af PFAS sorption til grænsefladen, ligesom Lyu et al. (2018) observerede, at forskellen mellem PFOA retardation i mættet og umættet jord var stor i fint sand, mens forskellen var lille i groft sand ved samme mætningsgrad.

Porevandskemi og kationer i vand-luft grænsefladen

Lyu og Brusseau (2020) observerede, at PFOA bevægede sig langsommere gennem umættede forhold ved stigende ionstyrke, og at pH spiller en mindre rolle for retardationen end ionstyrken. Flere studier bakker dette op (Le et al., 2022; Li et al., 2021), og det vises også af Le et al. (2022), at divalente salte kan have større indflydelse på sorptionen til luft-vand grænsefladen end monovalente salte.

Konkurrerende sorbater

Flere studier peger på, at tilstedeværelsen af hydrocarbon overfladeaktive stoffer kan påvirke PFAS sorptionen i luft-vand grænsefladen, og i nogle tilfælde konkurrere med PFAS, og dermed nedsætte sorptionen i umættet zone (Lyu et al., 2022). Samtidig har Constanza et al. (2020) vist, at

tilstedeværelse af kulbrinter kan forøge sorptionen til luftolie fasen, hvilket kan være relevant ved NAPL-forurening (forurening med fri fase).

Litteraturværdier for PFAS sorptionsparametre
Udvaskning af PFAS fra forurenet jord er som det fremgår af ovenstående afhængigt af flere parametre. Nogen parametre er lokalitetsspecifikke og nogen er mere generiske. De lokalitetsspecifikke er fx jordtype og de relaterede karakteristika (kornstørrelsesfordeling, indhold af organisk materiale), koncentration af forureningstoffet og tilstedeværelsen af andre stoffer. De mere generiske er fx K_d og K_{ia}. I den mættede zone kan sorptionen esimeres pba. K_d og i den umættede zone foregår sorption både til jorden (beskrives med K_d) men også til luftvand/grænsefladearealet, som beskrives ved K_{ia}. I dette afsnit opsummeres de værdier der er fundet i litteraturen for K_d og K_{ia} i forbindelse med overstående gennemgang.

Ifølge Silva et al. (2020) kan der antages lineær PFAS sorption til jord ved koncentrationer i µg/L størrelsesordenen. Det samme gælder for sorption til luft-vand grænsefladen (McGarr et al., 2023). Dermed kan fordelingskoefficienterne K_d (jord/vand) og K_H (Henry's konstant, luft/vand) anvendes til at kvantificere sorption. Eksperimentelt bestemte K_d-værdier fra fem nyere studier er opsummeret i tabel 2 for PFAS, der indgår i PFAS sum22. Tabel 3 giver et overblik over baggrunden for bestemmelsen af K_d-værdierne samt den overordnede konklusion. Studiet viser at der forsat er en del usikkerhed med hensyn til at bestemme K_d værdier og hvad der er relevant at have med. Det at værdierne for K_d er så forskellige, udfordrer vores forståelse af K_d som en konstant værdi som beskriver ligevægten mellem koncentrationen af et stof i vand og jord. Det er således muligt at man er nødt til at se på flere forhold end bare hvilken jord matrice og hvilket PFAS K_d værdien er gældende for. Dette er et område der fortsat forskes i.

Tabel 4 giver et overblik over K_{ia}-værdier for PFAS, der indgår i PFAS sum22. Værdierne er eksperimentelt bestemt, og ITRC (2024) henviser til al bagvedliggende data. Bestemmelse af K_{ia} værdierne er ikke en ny disciplin, men resultaterne viser ligesom for Kd værdierne et meget stort spænd, hvilket indikerer, at der fortsat er usikkerhed omkring hvordan parametren bestemmes.

K_d (jord/vand fordelingskoefficient) og K_{ia} (luft/vand grænseflade adsorptionskoefficient) er, som det fremgår påvirket af en række parametre, som ikke er listet op i tabllen. K_{oc} er ikke angivet, idet der i litteraturen sættes spørgsmålstegn ved anvendeligheden af et f_{oc}-baseret estimat.

Tabel 2 Litteraturdatasæt med eksperimentelt bestemte K_d-værdier for PFAS-forbindelser: Karakterisering og konklusion. Forkortelser i tabellen: foc organisk carbon.

Parameter Studie	Type	Vand-mætning	Konc. [µg/L]	Jordtype	pH	Konklusioner
Ngyuen et al. (2020)	Batch	Mættet	5	10 typer	6,2-7,7	Sorption af anioniske, kationiske og zwitterioniske PFAS er styret af forskellige parametre
Fabregat-Palau et al. (2021)	Batch	Mættet	>70	7 typer	5,2-8,0	PFCA og PFSA sorption kan forudsiges med foc, silt og lerindhold og længde af C-F kæde.
Høisæter & Breedveld (2022)	Kolon-ne	Mættet	<100	4 typer	-	Sorption ikke direkte forbundet til foc.
Campos-Pereira et al. (2023)	Batch	Mættet	<131	7 typer	4,6-8,2	Sorption omvendt proportional med pH
Hubert et al. (2023)	Batch	Mættet	5-50	1	-	foc-indhold vigtigste jordparameter for PFAS sorption

Tabel 3 PFAS specifikke K_d-værdier (jord/vand fordelingskoefficient) fra fem eksperimentelle studier. Se tabel 4 for yderligere detaljer.

			K_d[L/kg] [min;max]				
Under-gruppe	**Stof**	**C-F**	**Nguyen et al. (2020)**	**Fabregat-Palau et al. (2021)**	**Høisæter & Breedveld (2022)**	**Campos-Pereira et al. (2023)**	**Hubert et al. (2023)**
PFSA	PFBS	4	[0,1;1,1]	[0,6-6,8]	[1,7;11]	-	0,4
	PFPeS	5	[0,1;2,1]	-	-	-	0,4
	PFHxS	6	[0,3;7,8]	[2,4;21]	[0,3;0,5]	[0,3;23]	0,9
	PFHpS	7	[0,8;26,7]	-	-	-	1,1
	PFOS	8	[3,2;104]	[32;295]	[4,5;30]	[1;166]	6,8
	PFNS	9	[5,9;364]	-	-	-	32,1
	PFDS	10	[10,4;1284]	-	-	-	110
	PFUnS	11	-	-	-	-	-
	PFDoS	12	-	-	-	-	-
	PFTrS	13	-	-	-	-	-
PFCA	PFBA	3	[0,06;0,7]	[0,3-1,7]	[0,6-2,3]	-	-
	PFPeA	4	[0,04;0,7]	-	[0,3-1,1]	-	0,2
	PFHxA	5	[0,05;1]	[1,2;6,5]	[0,2;1,0]	-	1,0
	PFHpA	6	[0,3;6]	-	[0,3;0,9]	-	0,8
	PFOA	7	[0,5-9]	[2,6;38]	[0,2;1,2]	[0,1-29]	1,2
	PFNA	8	[1,3;31,8]	[11;128]	[1,8;8,6]	-	2,7
	PFDA	9	[0,9;123]	-	-	[0,9;151]	23,5
	PFUnDA	10	[11,7;249]	-	-	[1,4;812]	-
	PFDoDA	11	-	[422;3082]	-	-	-
	PFTrDA	12	-	-	-	-	-
Precursorer	PFOSA	8	-	-	-	-	-
	6:2 FTS	6	[0,2;5,6]	-	[0,7-2,5]	-	19,9

Tabel 4 PFAS specifikke K_{ia}-værdier ved 25 grader C. Kilde: ITRC (2024).

Under-gruppe	**Stof**	**C-F**	**K_{ia} (cm2/cm3)**	**Antal estimater**
PFSA	PFBS	4	[1,2e-8;10]	4
	PFPeS	5	8,8e-9	1
	PFHxS	6	[7,9e-9;141]	4
	PFHpS	7	7,3e-9	1
	PFOS	8	[7,4e-10;1950]	13
	PFNS	9	7,5e-10	1
	PFDS	10	[1,4e-8;0,07]	2
	PFUnS	11	-	-
	PFDoS	12	-	-

	PFTrS	13	-	-
PFCA	PFBA	3	[5e-4;2]	5
	PFPeA	4	[1,2e-8;7,2]	4
	PFHxA	5	[9,6e-9;27]	8
	PFHpA	6	[8,5e-9;100]	9
	PFOA	7	[7,8e-9;372]	13
	PFNA	8	[4,8e-8;1380]	7
	PFDA	9	[6,1e-9;5012]	7
	PFUnDA	10	[1,4e-8;15136	7
	PFDoDA	11	[1,4e-8;0,42	2
	PFTrDA	12	-	-
Precursorer	PFOSA	8	[5,2e-8;2630]	5
	6:2 FTS	6	-	-

Opsummering

En række studier har undersøgt udvaskning af PFAS fra jord med koncentrationer op til 400 µg/kg. Mclachlan et al. (2019) viste, at udvaskningen er størst for PFAS med færre fluorerede carbonatomer og høje koncentrationer. Weidemann et al. (2022) bekræftede, at kortkædede PFAS udvaskes hurtigere og med højere genfindelsesrate. Röhler et al. (2021) og (2023) demonstrerede, at udvaskningen af PFOS og PFOA kan forudsiges med kolonneforsøg, men at PFAS har længere udvaskningstid i felttests. Kabiri et al. (2022) viste, at pH og kemisk struktur har betydning for udvaskning, mens jordegenskaber har mindre betydning. Høisæter & Breedveld (2022) fandt, at PFOS-mængden i sandet jord ikke korrelerede direkte med organisk indhold. Lyu et al. (2018) viste, at adsorption i luft-vand grænsefladen står for 50-75 % af tilbageholdelsen af PFOA. Bierbaum et al. (2023) konstaterede, at høje L/S-forhold er vigtige for sammenlignelighed mellem studier.

Generelt konkluderes det, at:

- Kortkædede PFAS udvaskes hurtigere end langkædede.
- PFCA udvaskes hurtigere end andre PFAS ved samme kædelængde.
- Adsorption til luft-vand grænsefladen er betydelig.
- Jordegenskaber har mindre betydning for udvaskning af PFAS end kædelængde.

Udvaskning af PFAS fra forurenet jord påvirkes af flere faktorer, både lokalitetsspecifikke som jordtype og organisk indhold, og generiske som Kd (jord/vand) og Kia (luft/vand). I den mættede zone anvendes Kd, mens både Kd og Kia er relevante i den umættede zone. Eksperimentelle Kd- og Kia-værdier varierer meget, hvilket viser usikkerhed i deres bestemmelse. Forståelsen af PFAS-udvaskning kræver dermed omfattende forskning og kan ikke alene baseres på simple estimater.

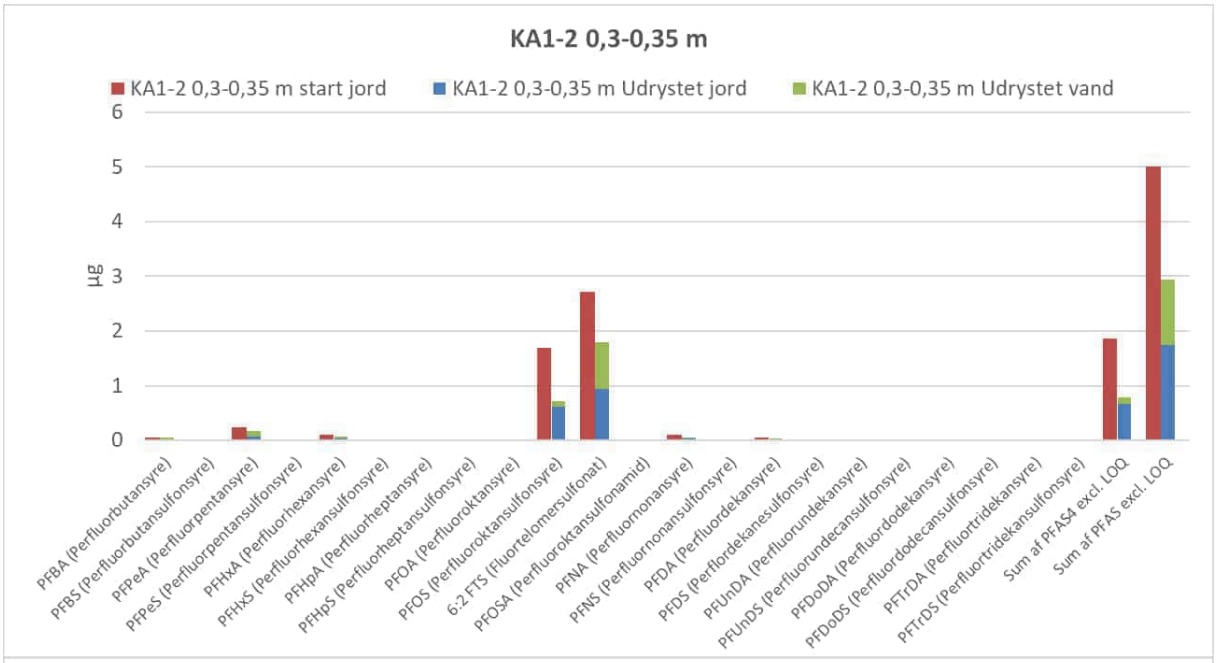
Der er ikke foretaget justeringer i feltarbejdet pba. litteraturstudiet, men den viden der er tilvejebragt er anvendt i forbindelse med fortolkningen af resultaterne.

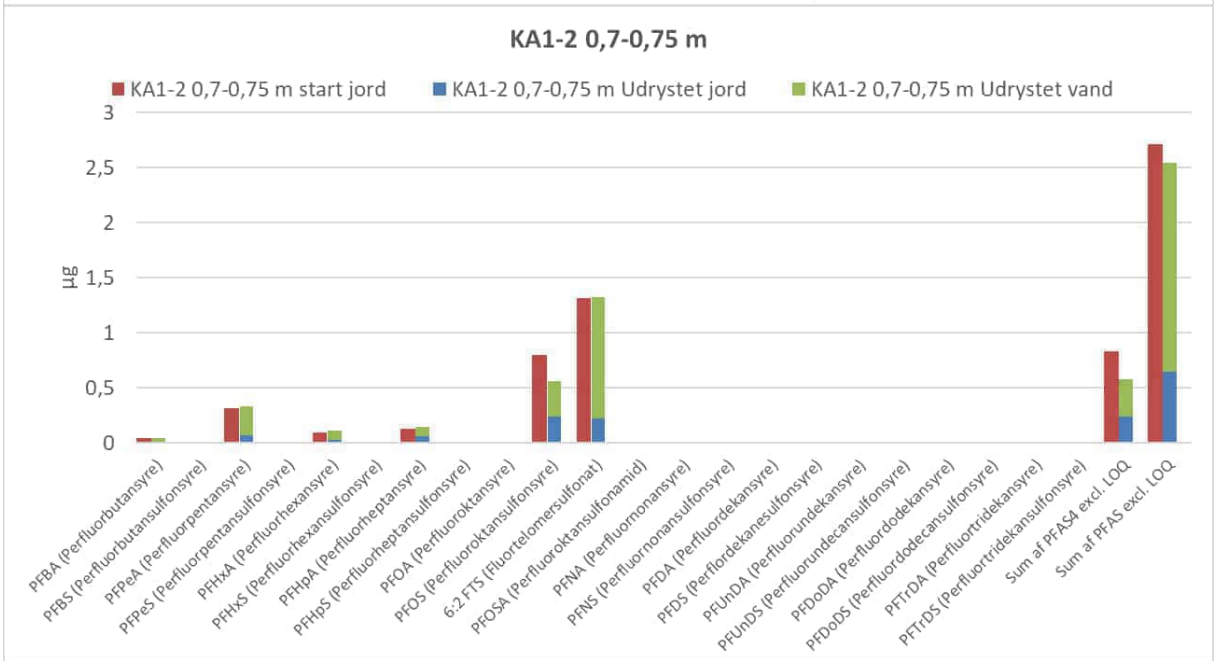
Bilag F Batchforsøg – massebalancer

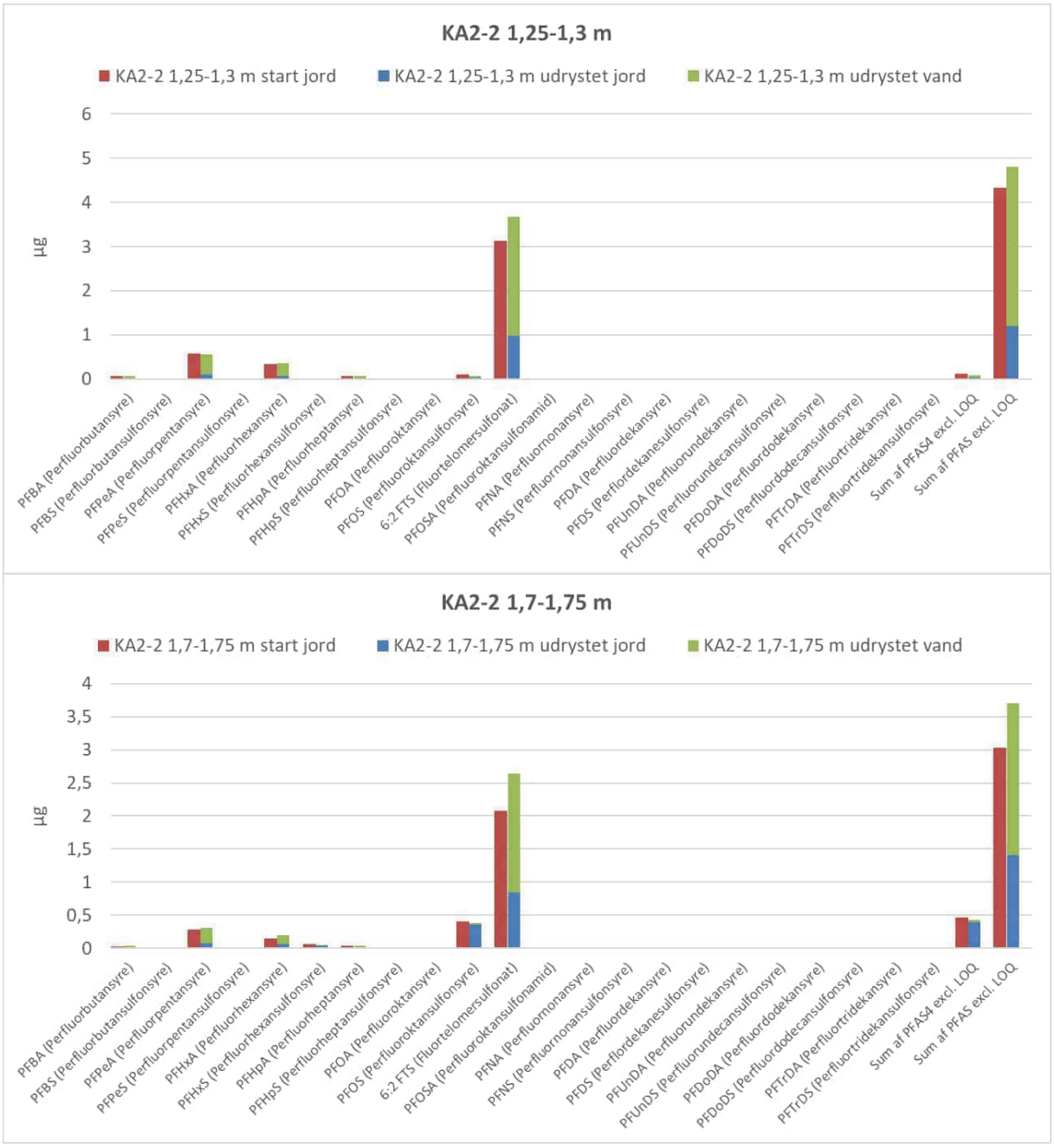
Bilag F

Batchforsøg – massebalancer

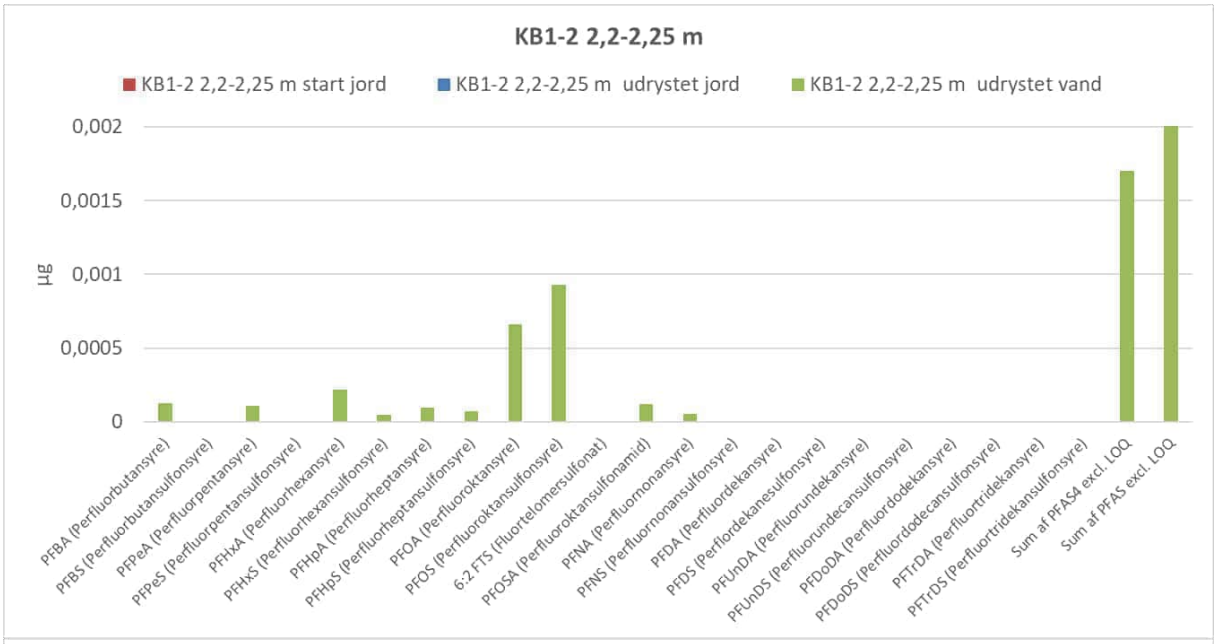
Lokalitet A

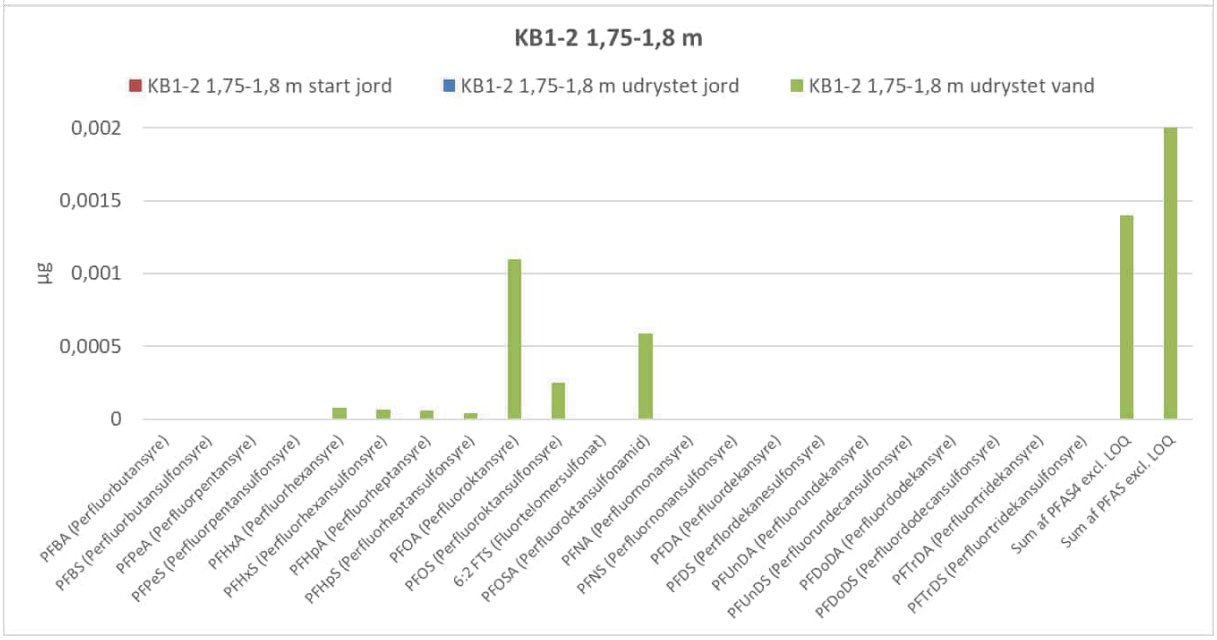






Lokalitet B





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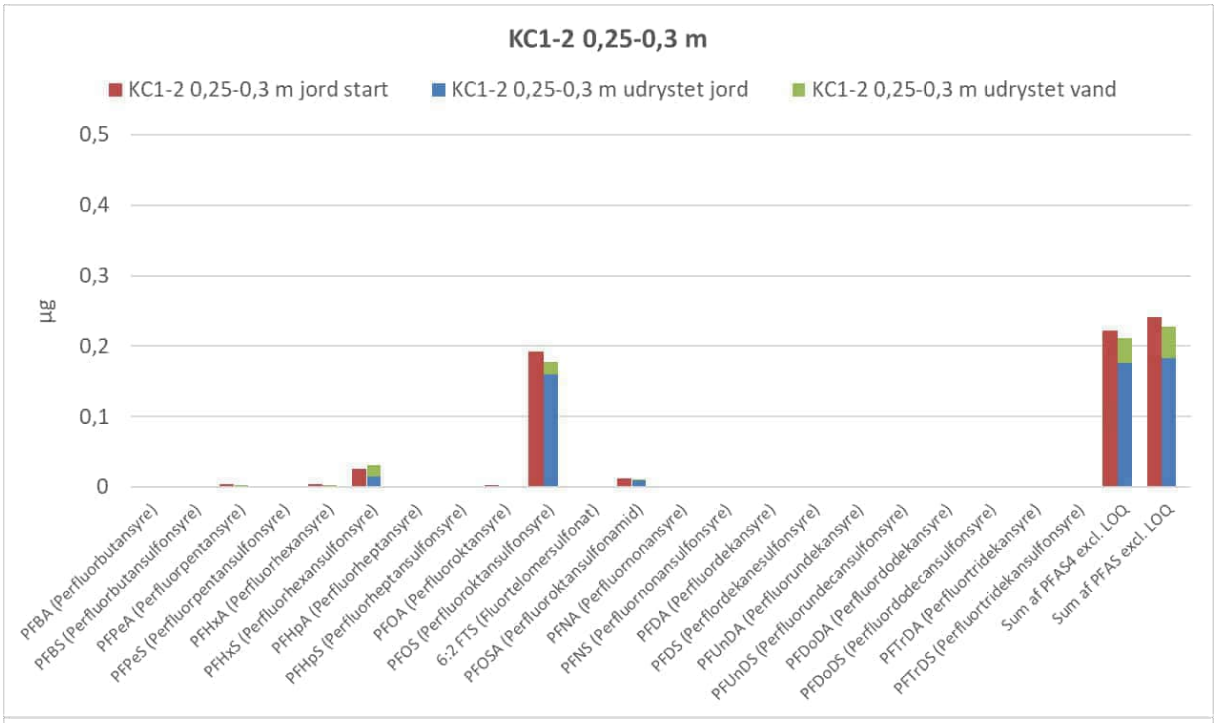
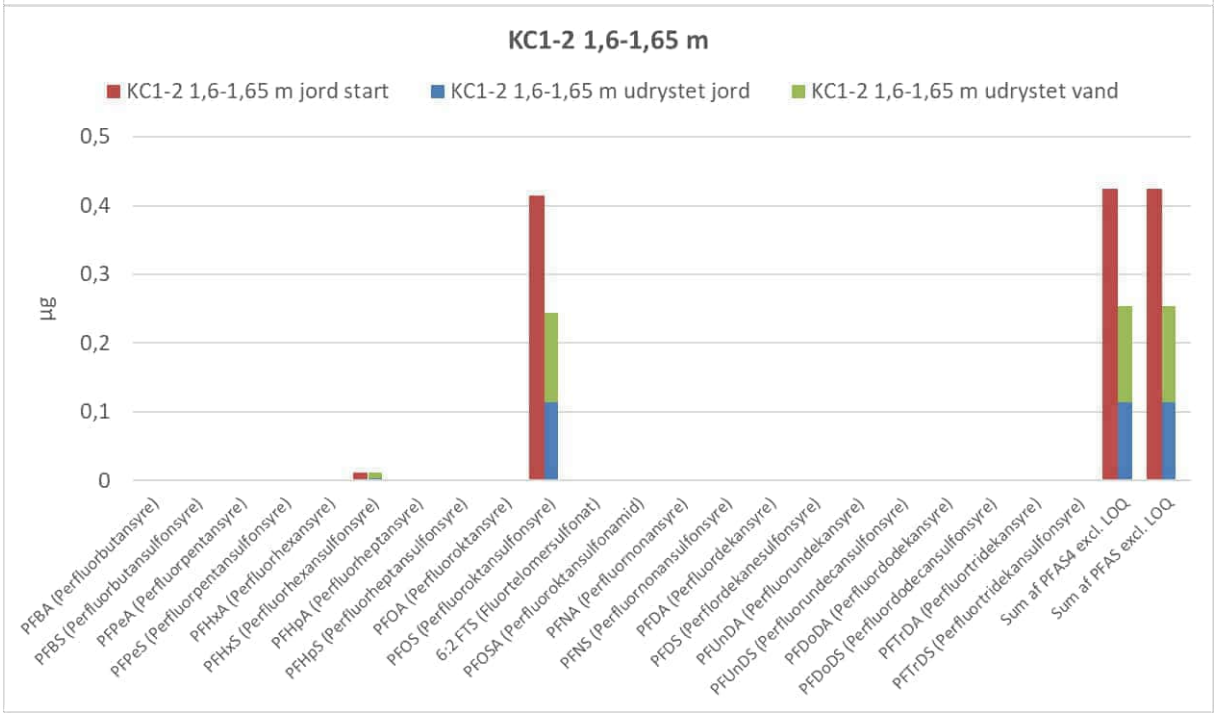
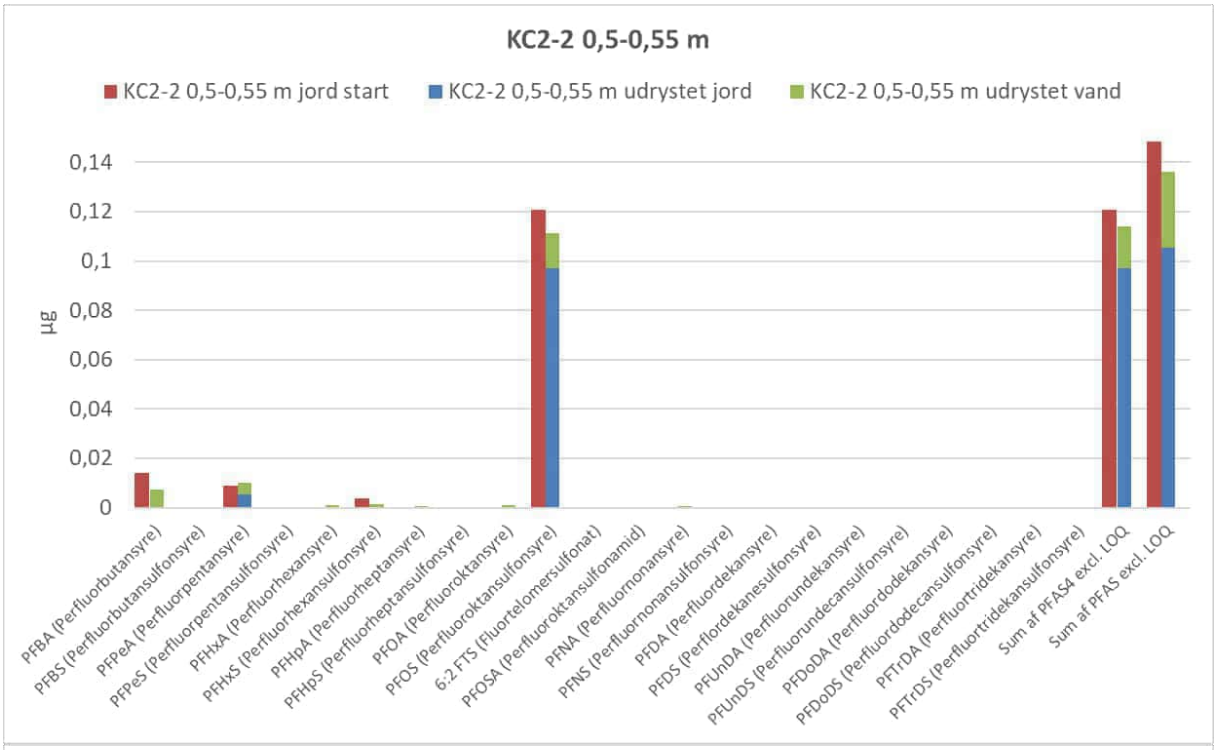
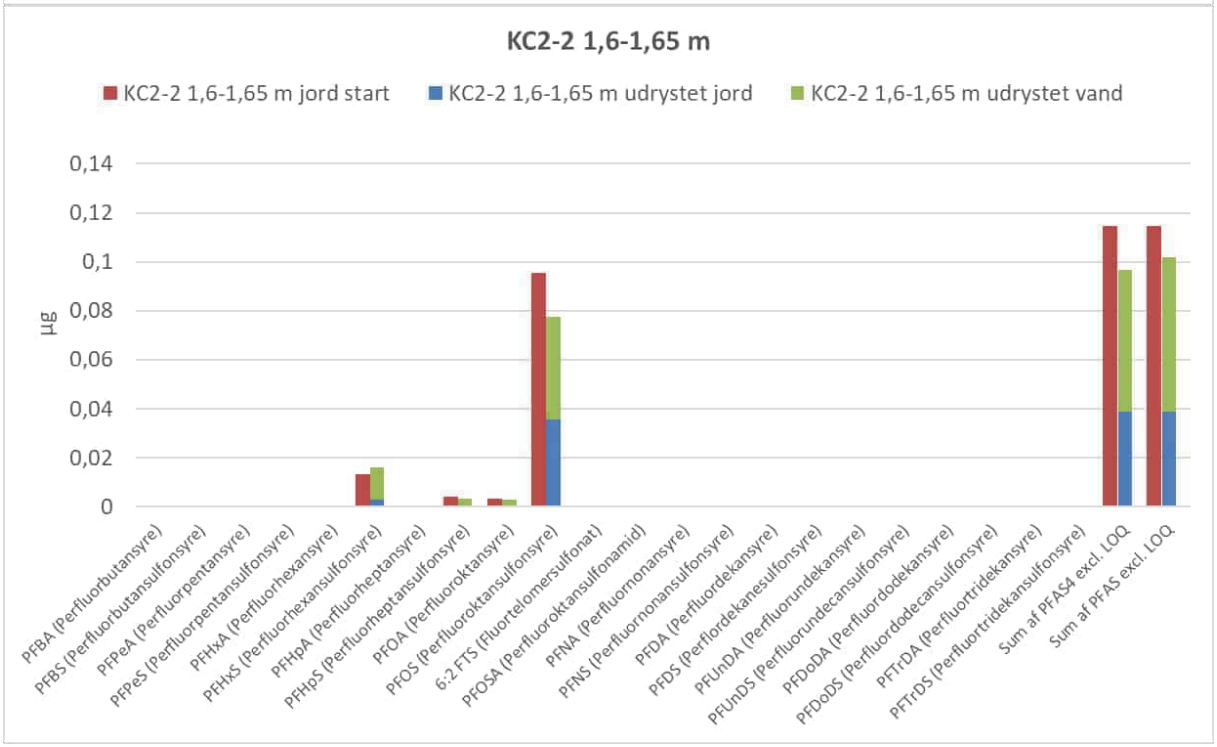






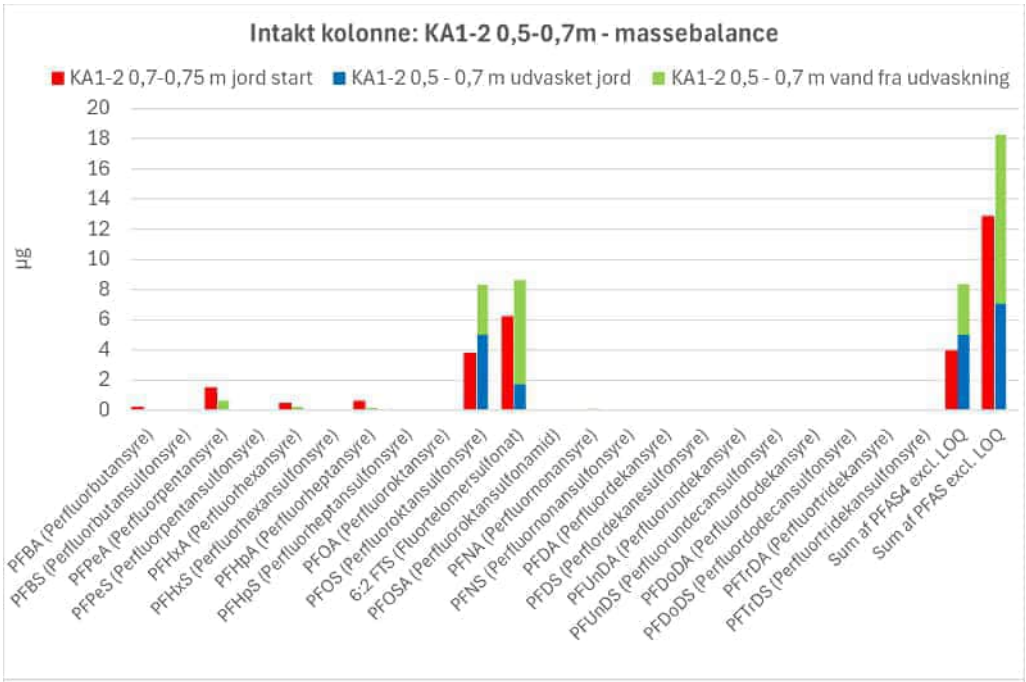


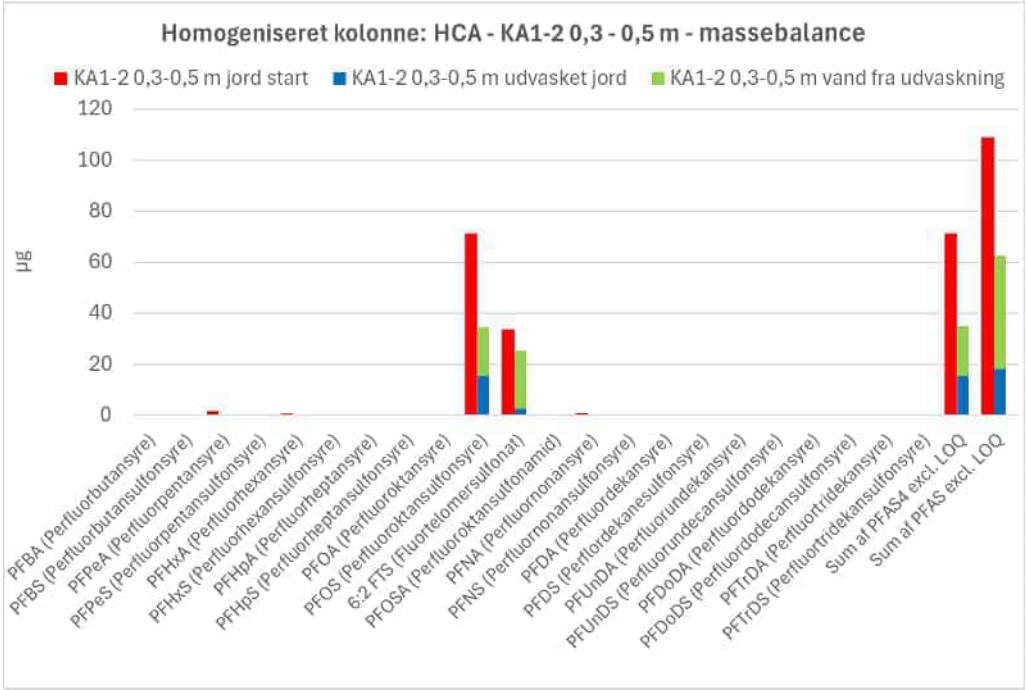
Bilag G Kolonneforsøg – massebalancer

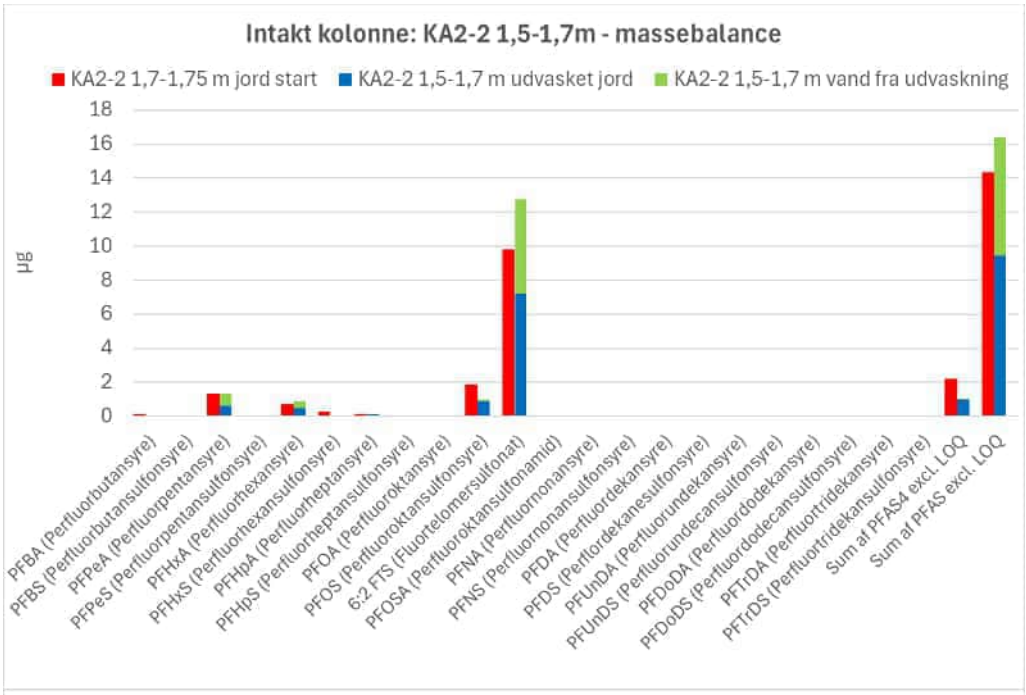
Bilag G

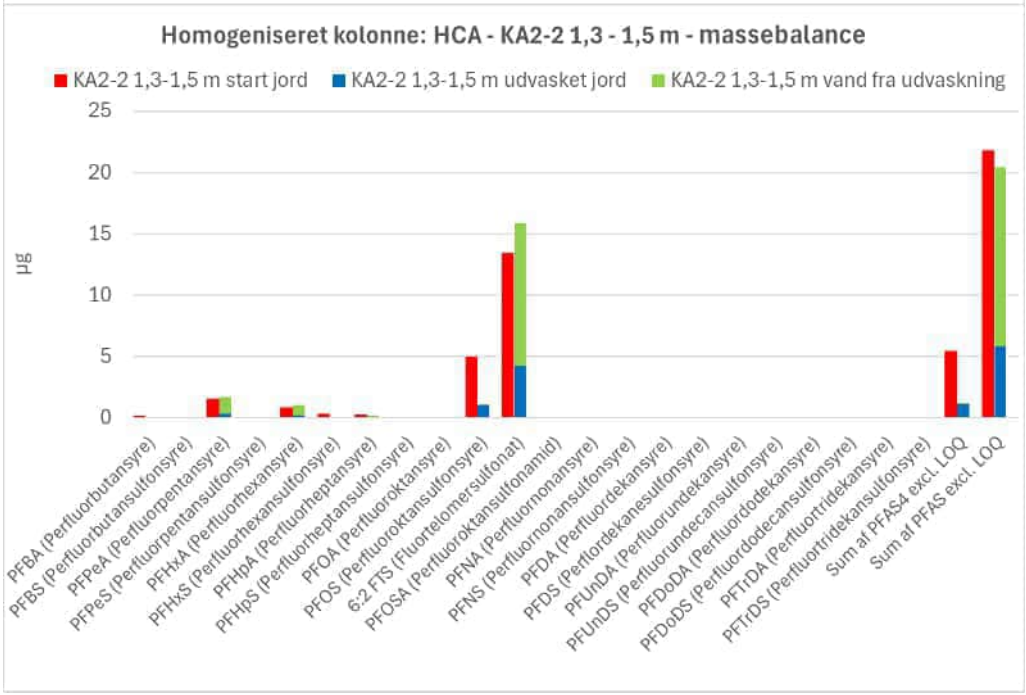
Kolonneforsøg – massebalancer

Lokalitet A

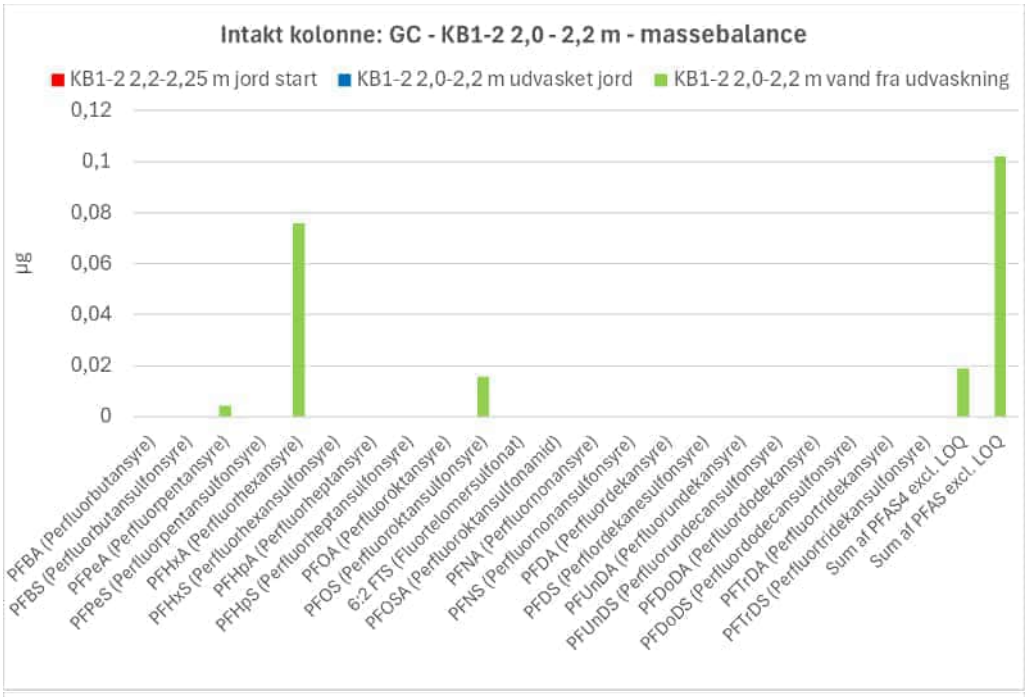


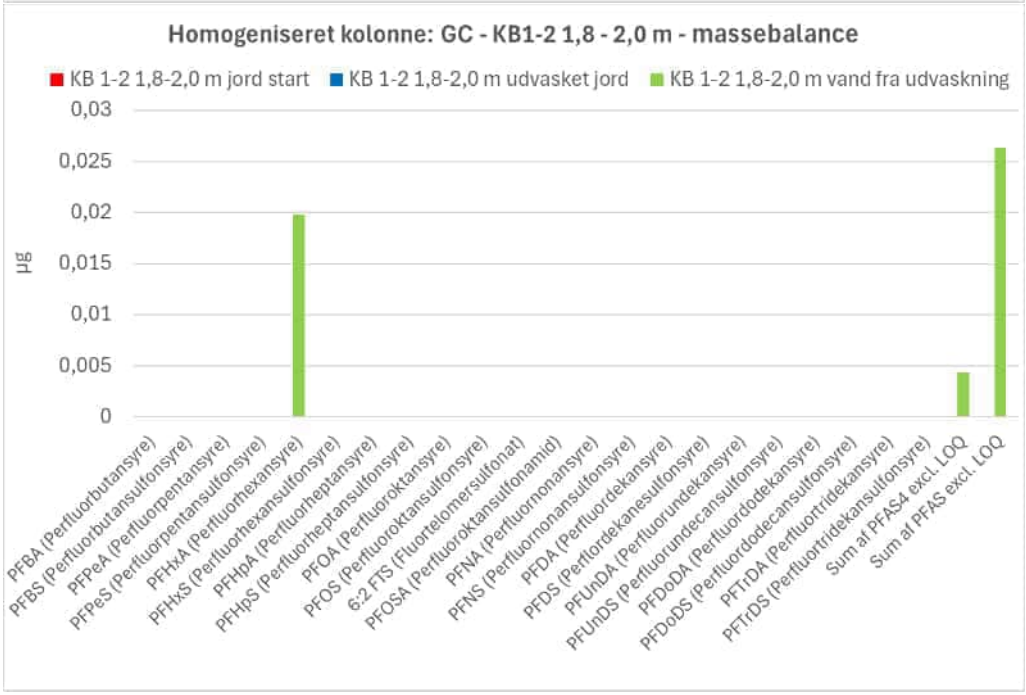


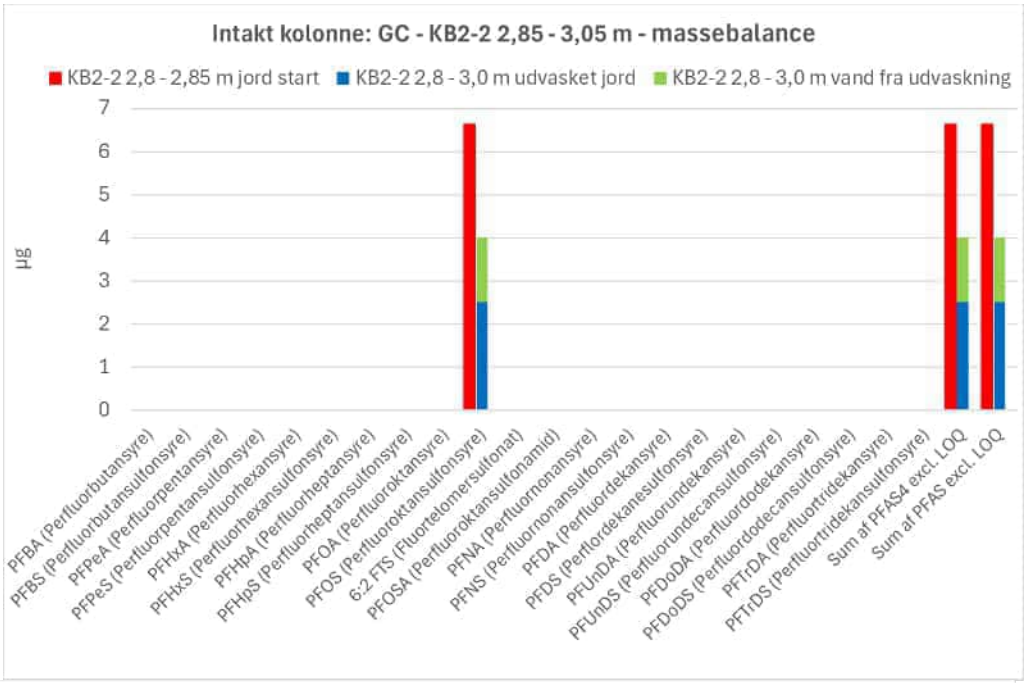


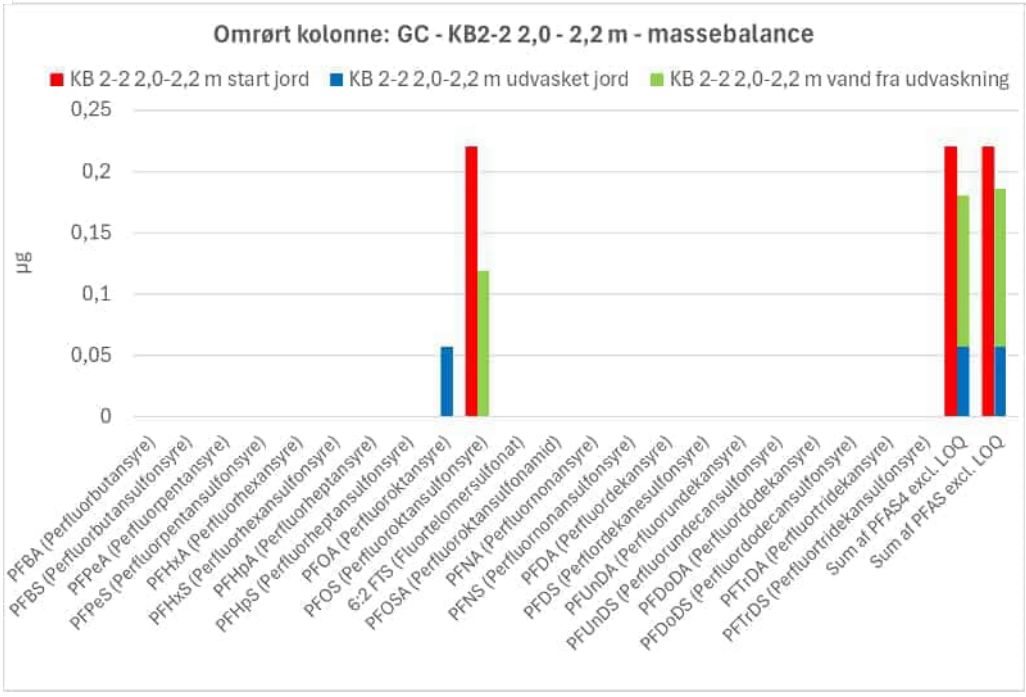


Lokalitet B

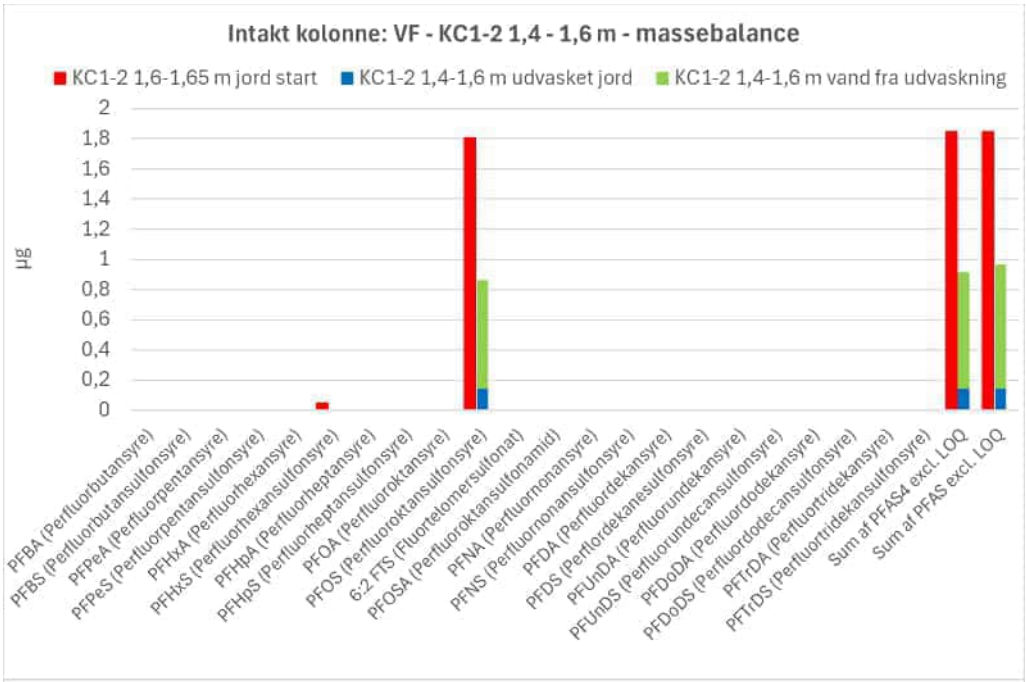


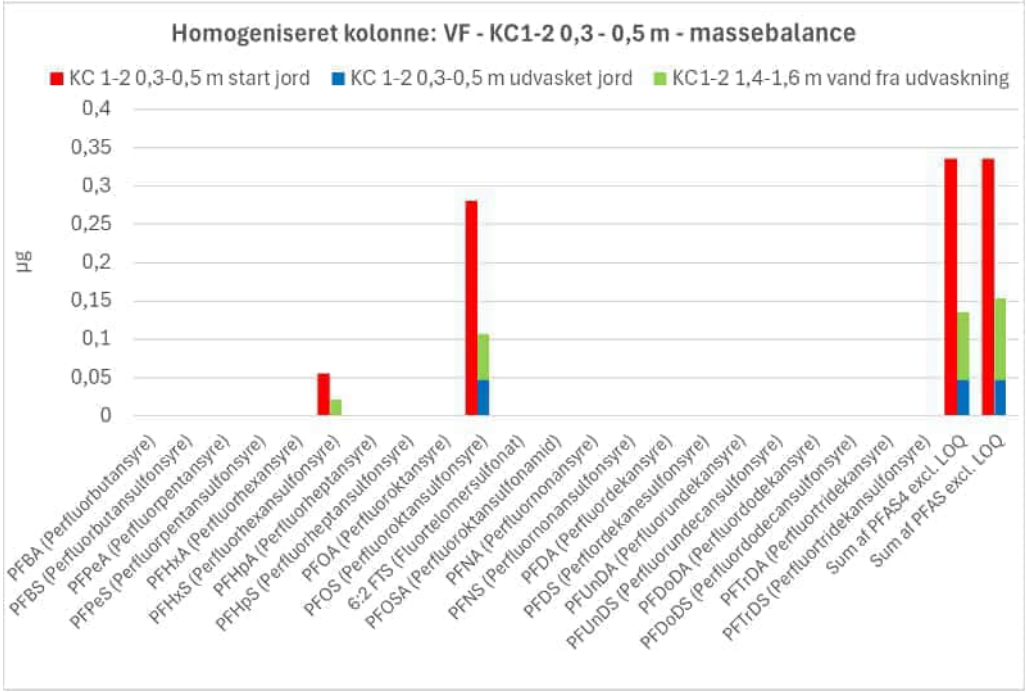


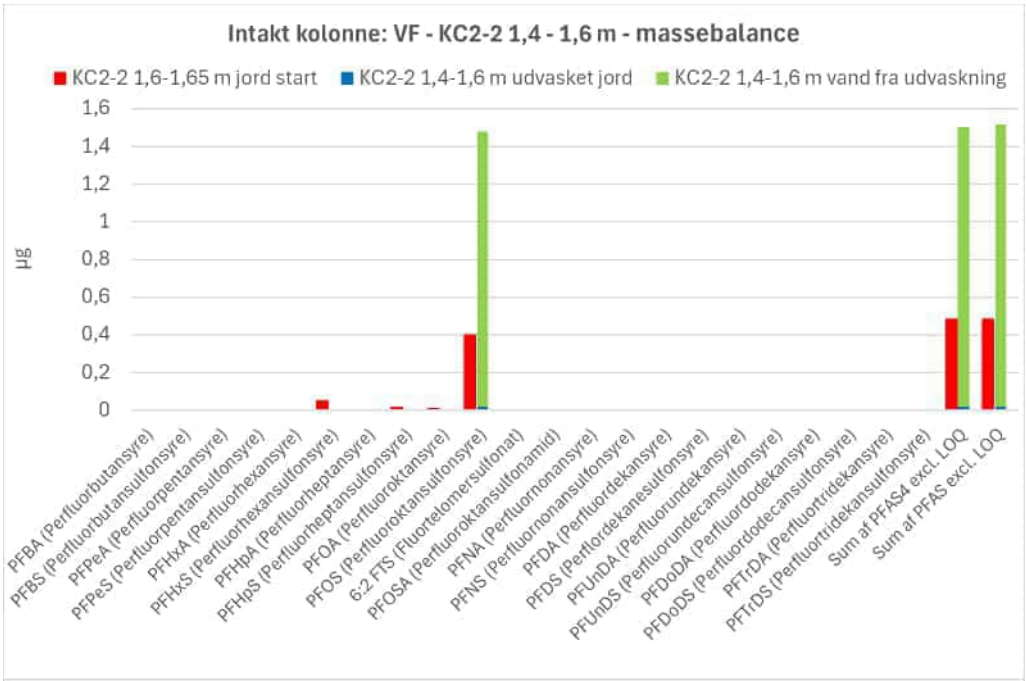


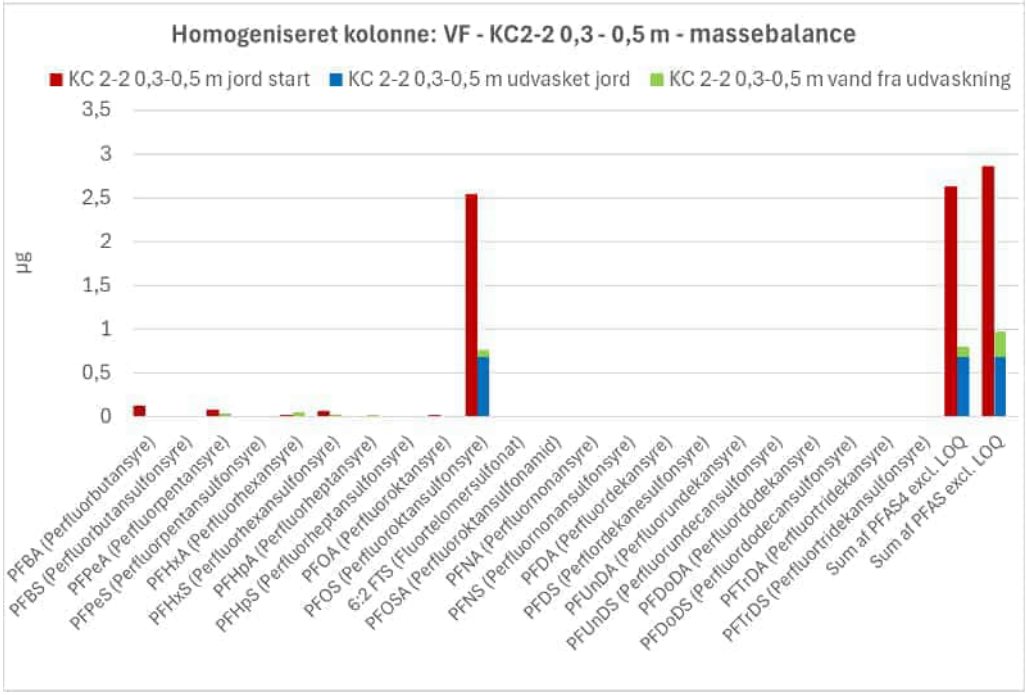


Lokalitet C









Bilag H Brilliant Blue

Bilag H

Brilliant Blue G

Fotodokumentation af kolonner efter gennemskylning med 0,2% Brilliant Blue G.

Lokalitet A
Intakte kolonner



Homogeniserede kolonner


Lokalitet B
Intakte kolonner

Homogeniseret kolonner

Lokalitet C

Intakte kolonner

Homogeniseret kolonne